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SOAP and SANITARY CHEMICALS

CONTENTS

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AS THE EDITOR SEES IT

ALTHOUGH higher prices for fats and oils have performed their customary function of stimulating production, with the result that production estimates are currently being raised, there seems to be little prospect that the soap industry or other domestic fat users can anticipate any substantial increase in their available supply of fats and oils at any time in the near future. That, at least, is what representatives of the fats and oils consuming industries were told at a meeting in Washington early this month at which officials of the Fats and Oils Division of the U. S. Department of Agriculture conferred with representatives of industry prior to issuance of figures on fat and oil export allocations for the second quarter of 1948. The department's continuing policy will be to export all fats and oils which can be considered surplus. Thus, though domestic crop prospects are fairly bright, this will simply mean a larger "surplus" to ship abroad, and the Marshall Plan, which seems slated for early passage, will assure that foreign buyers will have the necessary funds to buy these oil and fat stocks which are being earmarked for them.

Several warnings are in fact currently being sounded for soap makers on the oil and fat supply line. Imports of copra, which were at a record level last year, easing our fat supply problem immeasurably, can be expected to decline over the coming months. The maximum effect of the severe Philippine hurricane will begin to be felt along in April, when copra arrivals are expected to fall off substantially. And there seems to be no assurance that west coast crushers will be able to handle even reduced arrivals of copra, as they are currently faced with a thirty per cent reduction in supplies of electric power because of the serious water shortage there. A warning has been sounded also that if inedibles are in short supply, there is no intention of letting the industry use surplus lard stocks to make up the difference. World food shortages are still sufficiently acute that the industry will necessarily face serious opposition to any policy of using edible fats in the soap kettle.

SOAP sales since the first of the year have shown what appears to be a progressive slow-down. During January, the drop in toilet soap sales was much in evidence, becoming more pronounced through February as stocks were reported backing up on manufacturers. The decline in demand for laundry soaps, textile soaps and specialties followed on the heels of the toilet soap slowdown and by the end of February, producers were worrying about their increased stocks. Two manufacturers producing both laundry and toilet soaps confided to us that January and February, 1948, had been two of the worst months for sales which they had experienced in some years.

With the arrival of March first, reports that manufacturers were beginning to cut here and there in order to move their high-priced soap inventories, were more frequent. Firmly convinced that all prices are poised for a further decline, including soap prices, dealers are indicated to have let their stocks run down to the absolute minimum necessary to take care of their day-by-day needs. Refusal to buy at current levels may force price reductions upon manufacturers, that is if they want to move current stocks which all quite obviously are anxious to do.

That the present market could bring about a serious price situation for all soapers is obvious. With high-cost soap in warehouse, every soaper knows what he is up against,—and if prices really are set for a bad slide, he is out to save his skin. Economists may jabber about market potentials and production men may worry about high costs, but when the competitive heat is on and stocks of soap made from twenty-cent tallow start to back up on their makers, the urge to sell soap becomes very, very strong. A return to the old prewar rough-and-tumble technique in soap selling could be the next step.

FOR years, "free" has been a magic word in advertising. But, often it has been misused, has been merely bait for suckers. Obviously, the Federal Trade Commission has never liked the word, maintaining that its use in trade and advertising always involves some obligation which renders it untrue. Where a "free" offer involves any obligation to purchase, the FTC has gone on record against it. But the National Better Business Bureau has stepped to bat against the FTC ruling, maintaining that if there is no deception, such "free" offers should meet with full approval. BBB challenges FTC and urges a court test to determine the merits of its stand.

In making out its case, the Better Business Bureau states that no one is misled by an offer which says: "Buy three cakes of soap; get one free." If the three cakes are offered at their regular price, then the other is truly free, they maintain, and the necessity of buying three cakes does not alter the meaning of the word, "free," as far as the fourth one is concerned. They add that the FTC itself has argued that such offers are lawful.

Obviously, there is no deception, no fraud, no misrepresentation in an advertising offer of this kind. And we feel that the soap industry deeply appreciates BBB rushing forward, bat in hand, to defend its honor against any implied accusation of misrepresentation. But, if FTC took this matter to court, it might not be in such a simple, clear-cut case. They might find some other type of "free" offer, not altogether on the up-and-up like this soap deal, and end up by throwing BBB a curve ball. FTC does not usually go to court if it would appear that the other side can win.

A SALESMAN for one of the old-line janitor supply houses dropped in to see us recently with a view to picking up an order for some liquid soap, floor wax, para blocks and other stuff which we do not buy. Outside it was raining—but the weather did not deter this plugging salesman from "the swift completion of his appointed rounds," plus trying to sell us some of his goods. We questioned him,—and found out from him what we had learned from others engaged in selling janitor supplies, that sales resistance was growing, fewer people were buying and those who were buying, were buying less. But he was "holding his volume up pretty well by making more calls, especially on new prospects."

In discussing selling with this man, who is no newcomer to the field, we extracted from him what apparently appears to be the current thinking of his customers and how that thinking affects his sales. He said that the break in the commodity markets last month had a definite adverse effect on sales. If wheat could go down with a crash, so could liquid soap, or floor wax, or scrub compound—and maybe the break in grains was just the beginning of a long price decline. All prices are on the way down. When are you going to reduce yours? We are waiting for lower prices. We hesitate to buy because next week, it may be lower. Instead of a drum of liquid soap, ship us five or ten gallons to carry us over until we see what happens. And so on.

This was the general type of resistance encountered. But this salesman just kept making more calls,—and he refused to be pessimistic. Maybe he has the answer for everybody,—keep plugging. At any rate, his solution appeared to be working out pretty well for him.

ONE notable feature of the current oil and fat markets is the continued strength and demand for fatty acids, and likewise for the lower grade fats, oils, and foots from which the acids are made. The spread between the lower grades of fatty raw materials and the regular grades of whole oils has narrowed considerably during the past few months. In some instances, it has become relatively cheaper to buy the whole oils instead of foots, soapstock, and other by-product fatty materials for refining or splitting. And not only for soap making is the demand for fatty acids holding the market in a firm position. Ever widening uses of the acids for other industrial purposes add their effect in strengthening the market.

Soapers who have become more widely sold on the use of fatty acids over the past several years must compete for supplies with their growing popularity in other directions. If present actions of the market are a criterion, the movement toward expanded fatty acid producing facilities has not come too soon. But from where will come all the lower-grade cheap fatty raw materials to match this expansion?

Sodium CMC in Synthetic Detergents

by
Thomas H. Vaughn and H. Earl Tremain
Research Department, Wyandotte Chemicals Corporation

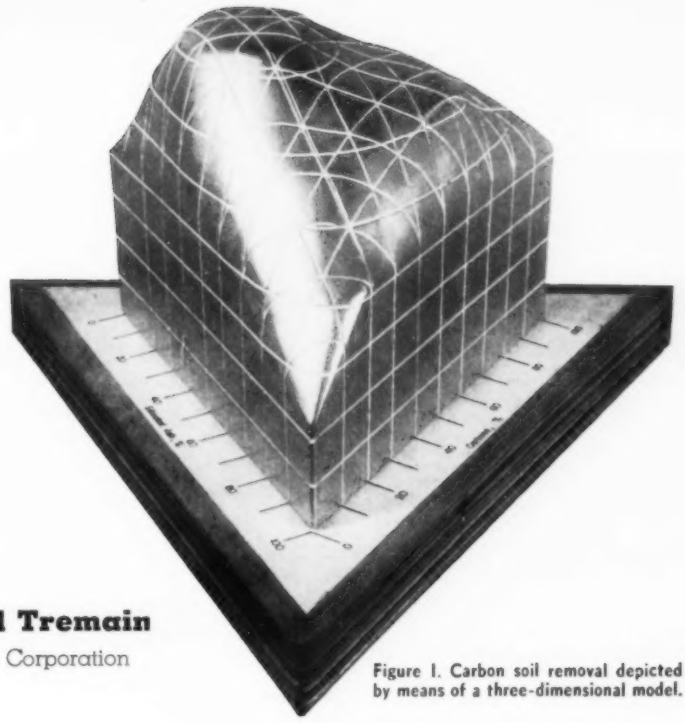


Figure 1. Carbon soil removal depicted by means of a three-dimensional model.

SODIUM carboxymethyl cellulose, also known as "Sodium CMC," which in recent years has become firmly entrenched as a highly important material in field after field, is now proving to be of great value in increasing the effectiveness of synthetic detergents. The versatility of this compound seems almost unlimited. In the textile industry, it turns up as a finishing and sizing agent and as a stabilizer of dye suspensions. In the paper industry it may be used as a size, as a pulp impregnant and in the production of grease resistant paper. It may be used as an emulsifier and as a protective colloid in dentifrices, wave setting solutions and hand lotions. In the pharmaceutical field, it forms a water soluble ointment base and an enteric coating for capsules. It may appear as a blending agent in ceramic clays and as a stabilizer in ice cream, chocolate milk and certain types of cheeses. It inhibits the crystalline growth of pigments and permits the preparation of highly efficient oil well drilling muds. Now that extensive investigation has confirmed its applicability to the field of detergency, its importance has been further increased.

Conventionally, sodium carboxymethyl cellulose is prepared from bleached sulfite wood pulp. The pulp is first steeped in a solution of caustic soda and then reacted with the proper amount of sodium monochloracetate to form the desired product. Illustrated is an idealized representation of several structural units of a sodium carboxymethyl cellulose molecule. The degree of substitution of the sodium carboxymethyl group is variable. Theoretically all of the three hydroxyl groups in each anhydro-glucose unit may be substituted. The degree of water solubility and rate of solution varies with the degree of substitution. In most commercial samples somewhat less than one hydroxyl unit is affected, 0.4 to 0.8 unit being the more common range.

The most striking difference between the sodium carboxymethyl cellulose molecule, and soaps and synthetic detergents lies in the enormous molecular weight of the former. Unmodified cellulose consists of chains of 200 or more glucose units. Although some breakage of chains occurs, the size of the sodium carboxymethyl cellulose molecule is probably of the same order. Thus the illustration (Fig. A, Pg. 38) depicts but a small fraction of an average sized molecule.

Technical sodium carboxymethyl cellulose is a cream to light tan colored product. It is substantially odorless and is thought to be physiologically inert (1). It usually maintains the same general physical appearance of the cellulose from which it is prepared.

Although sodium carboxymethyl cellulose has been known for many years, it was not until 1935, according to German claims, that its applicability to the improvement of detergency was discovered. In 1940, the Kalle plant of I. G. Farbenindustrie, which had sold cellulose derivatives such as the alkyl ethers, esters, etc., under the general trade name "Tylose," recommended the use of one carboxymethyl cellulose derivative, "Tylose HBR," with fatty acid soap products and synthetic detergent mixtures. The first general disclosure in this country of the possible value inherent in sodium carboxymethyl cellulose as a detergent improver came in a report issued in October, 1945 and written by L. F. Hoyt, a Quartermaster Corps consultant, who interviewed German technicians and inspected production facilities (2). He found that in Germany during the war, because of the

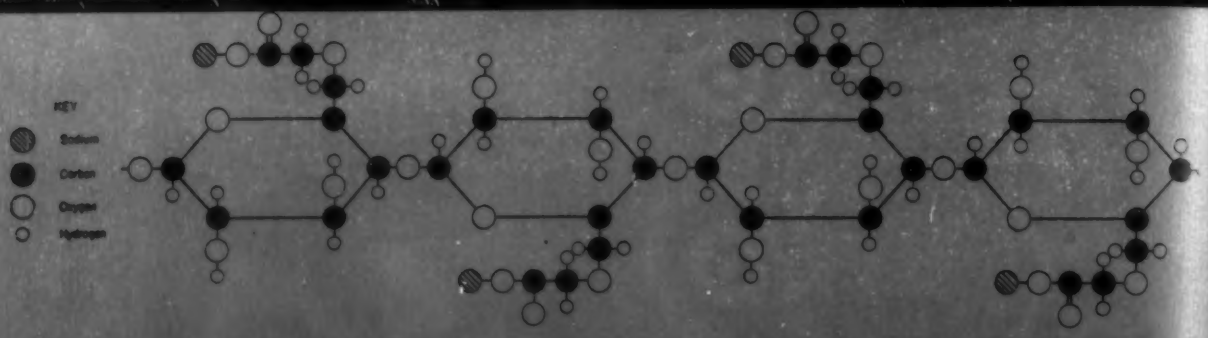


Figure A: Diagram of a portion of a molecule of sodium CMC showing four of the basic units of which the molecule is composed.

extreme shortage of fatty acids, sodium carboxymethyl cellulose had been used principally as a detergent extender in connection with fatty acid soaps and for detergency improvement qualities with low grade synthetic detergents. The possibility of its use with high grade synthetics to produce a detergent superior to soap was apparently not investigated and definitely not exploited.

The detergency-improving characteristics of sodium carboxymethyl cellulose were confirmed in these laboratories while carrying out research on sea water detergents under a contract with the Office of the Quartermaster General. Upon the termination of this contract in December, 1945, an extensive investigation was begun to develop a sodium carboxymethyl cellulose with high detergency promoting properties*, to improve production methods and to evaluate the detergency characteristics of systems of sodium carboxymethyl cellulose, alkaline builders and a sodium alkyl aryl sulfonate type of synthetic detergent**.

In general, the synthetics are poorer detergents than soap but their detergency is sufficient for many applications such as dishwashing and the laundering of wools, silks and synthetic fabrics which are more easily cleaned than cottons. In many secondary aspects which are, however, closely related to detergency, the synthetic detergents are superior to soap. Their calcium and magnesium salts are soluble; therefore, no bath tub rings, no hard water scum, and no unsightly films left to dull the luster of glassware. In fact, they often show, with respect to whiteness retention, a greater detergency in hard water than in soft water. They are generally effective in acid, neutral and alkaline media; but in one great field of application—both the commercial and home laundering of cottons, the most important fabric on the basis of relative quantities in use—the synthetics are known to be definitely inferior to soap. In spite of the necessity of using soft water or, as an alternative, wasting large amounts of soap, and despite the need of using many rinses, critically controlled as to time and temperature, fatty acid soaps have held until this time an unchallenged place in the laundering of cottons.

In these laboratories detergency with reference to cottons is considered to be composed of two principal and separate factors which may be evaluated independently (3, 4). The one—soil removal—applies to the capacity of a detergent solution to remove a soil from a soiled fabric,—while the other —whiteness retention—concerns the capacity of the solution to suspend a soil and prevent its deposition upon an unsoiled fabric. The addition of sodium carboxymethyl cellulose to a synthetic detergent improves to a remarkable degree both soil removal and whiteness retention.

THE magnitude of the detergency promoting powers of sodium carboxymethyl cellulose can be better appreciated upon the examination of typical data obtained in an investigation of three-component systems. In Figure 1, one such set of data for carbon soil removal is depicted by means of a three-dimensional model. Detergent mixtures for these tests were formulated from "Carbose" (technical grade of sodium carboxymethyl cellulose), "Kreelon 4D" (a flaked product containing approximately 40 per cent active sodium alkylaryl sulfonate) and a silicated soda ash builder. In all cases the total concentration of detergent mixture was held at 0.25 per cent. Tests were made in distilled water at a temperature of 140°F. Results are recorded relative to the soil removal ability of the synthetic detergent for which a value of 100 per cent is assigned. Thus in the model, the vertical distance between each two horizontal lines represents 25 per cent. Visible in the picture are the two axes for "Carbose" and "Kreelon 4D," and hidden in the silicated soda ash builder axis. It may be noted that with the exception of a small area beginning at the point "Carbose" = 0 per cent, where the formulations consist principally of builder with only a very small addition of "Carbose" and "Kreelon 4D," all other formulations give carbon soil removal values substantially greater than those of the synthetic detergent alone. As the basis for further comparison, a high grade, unbuilt, fatty acid soap widely used in commercial laundering gives by this test a value of slightly less than 150 per cent. Thus, all formulations lying in the area bound by the 150 per cent soil removal line (the sixth horizontal line in the picture, counting from the bottom) yield soil removal values superior to this soap. The peak value, 185 per cent, was obtained with a formulation consisting of 20% "Carbose," 60% "Kreelon 4D" and 20% silicated soda ash builder. This is the first time, to our knowledge, that the carbon soil removal properties of soap have been exceeded by any formulation based on a synthetic detergent of this type.

Whiteness retention determinations give equally unusual data. On the same basis of the synthetic deter-

* Carbose, a product of Wyandotte Chemicals Corporation, Wyandotte, Mich.

** Kreelon, a product of Wyandotte Chemicals Corporation, Wyandotte, Mich.

gent yielding 100 per cent whiteness retention, the fatty acid soap previously mentioned gave a value slightly under 200 per cent, while all formulations of the three components containing 15 per cent or more of "Carbose" yielded values exceeding that of soap and ranging to well over 300 per cent.

In Figures 2 and 3, respectively, are illustrated the carbon soil removal and whiteness retention properties of three series of detergent mixtures. In all cases the total concentration of detergent mixture is held at 0.25 per cent and all tests were run at 140°F. in distilled water. In each series of tests, the ratio of "Carbose" to builder was held constant so that what is shown essentially is the result of gradually replacing the "Kreelon" content with builder or a combination of promoter and builder. In Figure 2, it is to be noted that the replacement of increasingly large quantities of alkylaryl sulfonate type of synthetic detergent by sodium metasilicate pentahydrate as a builder gradually reduces the carbon soil removal properties; however, if as little as 10 per cent of the builder is replaced by "Carbose," the carbon soil removal properties are reduced slightly over a portion of the system but go through a maximum at which this property is rated at 25 per cent higher than the carbon soil removal property of the synthetic detergent alone. If as much as 50 per cent of the sodium metasilicate is replaced by "Carbose," the carbon soil removal properties of any proportion of this mixture with the synthetic detergent is greater than that of the synthetic detergent alone, reaching a maximum of approximately 155 per cent relative carbon soil removal when 25 per cent of the synthetic detergent is replaced by promoter-builder mixture.

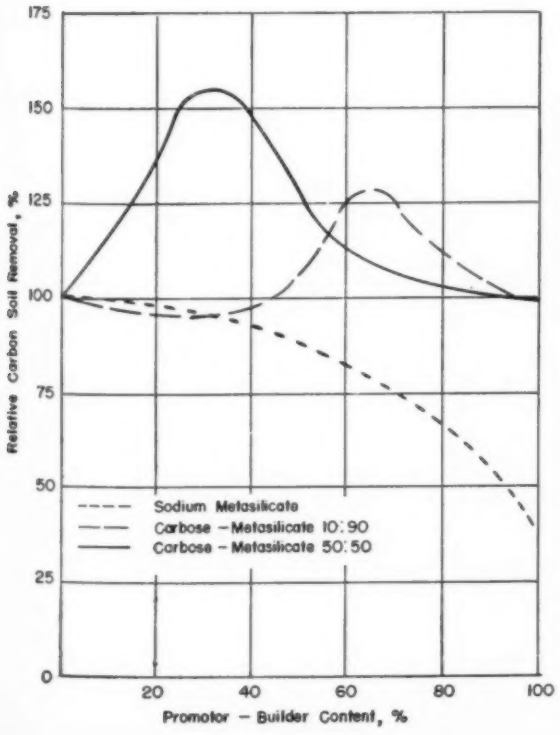
Similarly, in Figure 3, the addition of sodium metasilicate to the synthetic detergent rapidly reduces the whiteness retention properties of the detergent mixture. The replacement of as little as 10 per cent of the metasilicate by "Carbose" maintains the relative whiteness retention properties above the 100 per cent line for all ratios and the replacement of 50 per cent of the builder by "Carbose" results in even more favorable whiteness retention characteristics.

THESE results are already proving to be of the greatest importance in the commercial laundering of cottons where the detergency of fatty acid soaps can be equalled or exceeded with none of the disadvantages of soap and all of the unique advantages of synthetics. Synthetic detergent mixtures containing no fatty acid soaps but having "Carbose" incorporated in them are already being used in several hundred commercial laundries. Excellent results have been obtained not only with cottons but with all classes of fabrics and with soils running from the lightest to the heaviest. In commercial practice, using conventional fatty acid soaps, the laundryman finds himself in serious difficulties if the soap content becomes reduced to the point that the suds drop in the wash wheel. No such problem exists with the synthetic detergent—sodium carboxymethyl cellulose type of product. The supply of these materials may be reduced until sub-standard work is obtained but no serious break in quality is necessarily encountered during this reduction.

The ability of a synthetic detergent formulation containing sodium carboxymethyl cellulose† to remove stains and scorch marks from cottons was recently demonstrated using as a test piece a towel which had been hanging in the bathroom of a house during a bad fire. Smoke damage was serious and temperatures as determined later by the melting point of a partially melted metal object found near the towel, reached approximately 575°F., quite sufficient to scorch the towel

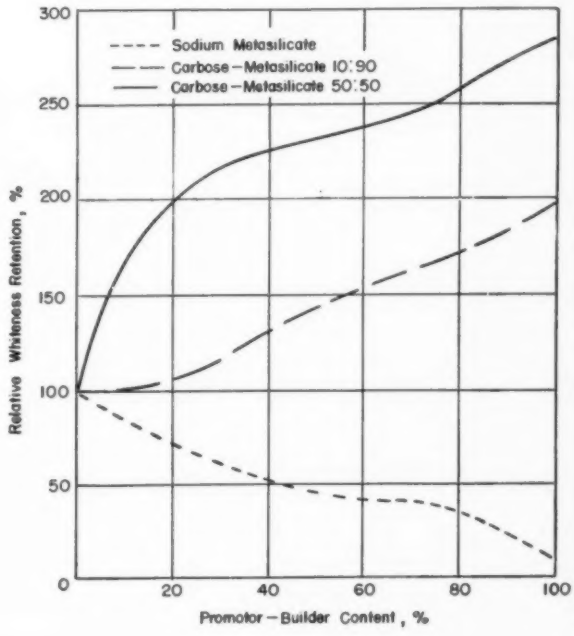
(*Turn to Page* 98)

† Skortex, manufactured by Wyandotte Chemicals Corporation, Wyandotte, Mich.



← Figure 2
Effect on carbon soil removal of the addition of sodium metasilicate with and without Carbose to Kreelon 4D. Total concentration 0.25% in distilled water at 140°F.

Figure 3 →
Relative effect on carbon soil removal of the addition of sodium metasilicate with and without Carbose to Kreelon 4D. Total concentration 0.25% in distilled water at 140°F.



Above: Coupon-type soap wrapper (center). Notice premium sketch and copy emphasis on saving coupons at bottom. At right: premium catalog cover and silverware premium, left.

PREMIUMS—Do They

J. M. Davidson*

Colgate-Palmolive-Peet Co.

*Based on a recent talk before the Premium Advertising Assn. of America

ABOUT seventy-five years ago, B. T. Babbitt decided to put a wrapper around his cake of soap and to reward users for their patronage by giving them premiums in exchange for those wrappers. In so doing, Mr. Babbitt was not discovering a new principle of doing business, he was simply adapting to his business a principle which was well established through the centuries, back to the days of trade and barter.

The use of premiums or gifts to establish goodwill and to foster patronage is as old as history itself. The ancients knew the power of the free gift—we read Biblical accounts of the visit of the Queen of Sheba to King Solomon—and of the three Wise Men from the East bearing gifts. In early Rome, patrons of the baths were rewarded for regular attendance with rare perfumes and magic charms. Many of us remember the old days, when the baker gave us thirteen buns instead of the twelve for which we paid. The "baker's dozen", including the extra free bun, won many loyal customers.

While Mr. Babbitt did not discover the principle of premium advertising, he was, so far as any of us know, the first to adopt the redeemable coupon of modern business. In the intervening years the idea of premium giving has been expanded and amplified so that today there are many different ways by which premiums are used for the basic purpose of increasing sales.

The coupon plan of rewarding consumers for regular patronage has in recent years been somewhat overshadowed by the faster growing "self-liquidating" type of premium offer. The reasons are quite clear. The

"self-liquidator" can be worked without cost to the advertiser so far as the premium and postage are concerned, (2) the "self-liquidator" has a quick acceptance on the part of the consumer because of her satisfactory experience with such offers; and (3) the radio has a large influence in expanding the use of "self-liquidators" because of its flexibility, that is, the quick starting and stopping offers promoted over the air. The foregoing three points are advantages which the "self-liquidating" offer possesses over the so-called coupon plan, however, the "self-liquidating" offer usually requires the consumer to buy only one package of the product in order to get the single box top required. Its influence is directed toward getting consumers to *sample* the product. It fails to insure *continuity* of use.

The particular feature which distinguishes the coupon plan from the "self-liquidating" and most other forms of premium advertising is the double effect which it possesses of winning customers to a product and, what is of greater importance, holding them as loyal customers. The problem of winning and holding customers is one which all businesses have in common. We might better say that this is really two problems: (a) holding present users and (b) creating new ones. We must be equally diligent about accomplishing both objectives, for business would soon stagnate if we succeeded only in holding old customers and failed to expand our market. Whereas, if we fail to hold old users, we will soon find new customers increasingly hard to discover and too costly to acquire. Some manufacturers talk of "brand loyalty" and assume that the same customers continue to buy the same products week after week, notwithstanding competitive efforts to shift them over to other brands. This illusion was exploded by C. C. Rogers of Industrial Surveys Co. in a recent talk before the Grocery Manufacturers of America. He attacked the "myth of brand loyalty" and said, "brand loyalty is not a fixed asset. Don't overestimate the enthusiasm of a group of families whom you consider your loyal customers. Brand loyalty is based on the *quicksands* of consumer favor." He pointed to a leading brand of food product and showed that in a single month, the families that were supposedly regular users of that brand, actually gave just over ¾ of their business in that product class to the brand, while 12 months later, these same families were giving less than ½ of their business to that brand. The particular brand, however, was not losing business because it was gaining new customers during this period. "This constant turnover of customers," Mr. Rogers said, "even among the healthiest advertised brands, provides the real answer to a question asked by all of us—'Why does advertising pay?' It pays simply because you have to constantly keep your brand before the public—to pick up new customers to offset those that you lose."

A manufacturer's share of his market volume has been likened to a barrel, which unfortunately is a leaky barrel, so that customers are always falling out of the bottom. The only way to keep the barrel full is to keep adding new customers at the top. Anything that will keep the customers in the barrel, which will retard the leak at the bottom, and maintain the intake of new customers at the top, is worth knowing about. It is this function which the coupon plan performs best. The coupon plan is a direct application of the "reward" psychology. "Use my product regularly—save the coupon which comes with each package—and I'll exchange these coupons for a nice premium," says the manufacturer. This method has the most direct application to keeping the barrel filled with loyal customers. It is not a transitory offer—a temporary "shot in the arm." It is a continuing inducement which attempts to interest the customer in a particular premium and then to encourage her to accumulate the required coupons through her regular use of the particular product. This type of offer has its counterpart in the "advance premium," used by the wagon route salesmen of the tea and coffee trade. While in the latter case the housewife gets the premium in advance and works out its purchase price in trade, nevertheless both plans have as their basic principle—the rewarding of the consumer for consistent, continued patronage.

Supported by the necessary advertising, the coupon plan fulfills the double purpose of attracting new customers, while it holds the old ones to a regularity of purchases not duplicated by any other form of premium use. And it has the unique advantage of binding a consumer to the product with ever-increasing force. Judge for yourself how difficult it would be to divorce a housewife from a product when she had saved 75 or more coupons and needed just a few more to get the premium she wanted. Or when she had obtained with her coupons part of a tea set and had her mind made up to complete the set. We are dealing here with one of the fundamental characteristics of the human race—the desire to possess, to get something extra—and when you have that force working for your product, it is a very powerful promo-

Help Sell SOAP?

A discussion of the two types of premium offers. The coupon plan is felt to be better than "Self Liquidator" because it wins and holds customers.

tion. Elbert Hubbard, many years ago, said, "The premium method of merchandising will live as long as trade itself, because it moves with the tides of the human heart."

But it is argued that the coupon plan does not lend itself to use by all products—that it may work for products which are frequently purchased but not for products which are purchased occasionally—once a month or so, for example. In other words, the consumer cannot save coupons fast enough to get the premium in reasonable time. There is, of course, justification for that objection. King Solomon may have had that in mind when he said in his Book of Proverbs, "Hope long deferred maketh the heart sick." But there is a way around that objection—in fact, two ways. One way around that difficulty is to give the consumer the option of paying for the premium with coupons alone or with coupons and cash. There are many companies that use this method — one which comes first to mind is General Mills in their "Gold Medal" flour promotion.

This method of offering the premium for a coupon and cash price is practical and obviously successful, but it may involve a tendency which must be guarded against. For instance, the amount of cash required must be kept low enough to insure that the consumer gets a bargain—a premium value. Remember that she is led to expect that extra value implied in a premium offer, and will be disappointed if she does not get it. We hear occasionally of a company trying to make a profit on its premium operation, which is bad business and questionable ethics. Obviously the cash-coupon plan must not include any Fair-traded items as premiums, and if the premium falls in the luxury class the excise tax must be included in the cash price.

The other way around the difficulty is for companies to join together in a cooperative premium plan which makes it easy for the consumer to get premiums by combining the coupons from the associated products. The premium advertising is thereby made more effective and costs of operating are brought down, so that both the consumer and the co-operating companies benefit.

Colgate originated such a plan some twenty years ago. They saw that the Borden Company had stores located in the same cities and often in the same neighborhoods as the Colgate "Octagon Soap" premium stores and that the same customers redeemed coupons in both stores. It was, therefore, a logical step to consolidate these stores—which resulted in considerable saving to both Borden and Colgate. But the far greater advantage was the ease by which the consumer could obtain her premiums, since she could then combine her Borden and Octagon coupons for the same articles. The result was apparent in increased redemptions for both companies, which of course reflected itself in greater sales of milk and soap.

Developing this advantage, other companies were invited to join the cooperative group, which now consists of Colgate, Borden, Kirkman, W. B. Reily & Co., Rumford, Ballard, LaRosa, Filbert and General Foods.

To show how the cooperative plan affects the consumer, let me say that before the consolidation, a family that used the "Octagon" brand of soaps regularly, could accumulate about 200 coupons in one year. The average customer visited our store to redeem her coupons about once a year or even less often. Now, with the ability to combine her coupons from all associated products, she comes in on the average of twice a year and has an average of 300 coupons each time. So the consumer gets bigger and better premiums and get them more often. And her more frequent visits give us the opportunity to make a more loyal customer of her by demonstrating the full line of coupon bearing products and by keeping her sold on the advantages of saving coupons.

To serve our premium customers we have 47 company-operated premium stores and some 2,200 premium agencies. These outlets are pretty evenly distributed over our operating territory—from Maine to Florida and west to approximately the Mississippi River. In addition we operate a mail department to handle orders from territories where there are no local redemption facilities.

Our stores carry a full line of available premiums while the agencies (which are departments set up in furniture or other retail stores) carry a large or small assortment depending on the amount of coupons redeemed.

Normally we list about 1,000 items in our premium assortment. Before the war the bulk of our business was pretty evenly divided among certain leading lines: Chinaware, enamelware, aluminumware, glassware, dry goods. The balance was done in pottery, silverware, lamps, kitchen utensils, tinware and miscellaneous items. In the present market we have not been able to keep up the prewar variety and of course are constantly on the lookout for attractive merchandise in our price class.

New items presented to our purchasing department are first passed on by a committee. If approved, a small test quantity is purchased for distribution to certain of our stores. There the item is subjected to a consumer-test and a careful check is kept on sales. If the results are satisfactory, the item is listed on the order form for all stores.

The most popular of our items are selected for distribution to the 2,200 agencies and those that are of a mailable nature are illustrated in our mail catalog which is published every six months.

Occasionally we pick from our assortment certain premiums for special featuring in our advertising. Such premiums are supplied in quantities to all stores and agencies. Needless to say the volume used of such items runs into large figures.

Once a year, or more often if necessary, the record is reviewed to determine the movement of all premiums—those that fall under a minimum standard are discontinued, while the more popular lines are expanded where possible.

In terms of retail cash price, our premiums range from 10c to $10.00 or $12.00 each. However, over half of our volume is in items selling at

(*Turn to Page* 98)

Soaps for Cleaning Leather Find Wider Use as Service Lessons on Treating Leather Goods Are Not Forgotten in Civilian Way of Life.

BY MILTON A. LESSER

ONLY a few years ago it seemed that saddle and leather soaps were restricted to a rather limited market, and to a shrinking one at that. More recently, the picture has changed. Now there is renewed interest in and increased sales of these specialized cleaning products.

In part, this change may be attributed to the lessons learned by men and women in the services regarding the care and preservation of leather equipment. Another important contributing factor is the growing realization that the life of expensive leather goods may be multiplied many times with proper treatment. Many popular articles on the care of leather have stressed the importance of using a good saddle soap to clean the items prior to further renovation treatments. Indicative is the suggestion that used leather articles be reconditioned by cleaning them with a saddle soap several times a year or as often as needed.

Aside from their obvious value for cleaning saddles and harness, leather soaps are recommended for use on shoes, handbags, luggage, leather coats, upholstery, gloves, belts, bindings, sports equipment and other items. For example, a Government publication (1) on the conservation of leather shoes advises that where dirt has become deeply imbedded, the use of saddle soap is often effective. Thick suds should be made with the saddle soap and worked well into the leather, and then wiped off with a cloth wrung out of water or with a sponge. Some of the dry soap may then be rubbed well into the leather and the shoe allowed to dry at room temperature.

Of interest in this connection is the use of a soap in the process developed by the Quartermaster Corps during the war for salvaging and renovating Army shoes. After grading and sorting, the shoes were put in a washing tank and swirled in a soap solution for five minutes, then rinsed for two minutes. Next, they were thoroughly sterilized and, finally, before the shoe rebuilding operations, were completely mildewproofed. (2)

Even white shoes, if made from a good grade of leather, may be cleaned with saddle soap and then with a good white shoe polish. Natural and dyed leathers may also be cleaned with saddle soap. As a general procedure, a damp sponge or soft cloth, rubbed lightly over the soap, is applied to the leather to make a lather. This may be wiped with a clean sponge or cloth and allowed to dry, away from heat or direct sunlight. When dry, the leather is finished by rubbing with a soft cloth. With soaps containing polish-imparting agents, this treatment also leaves a good luster on the leather. With soaps designed primarily for cleansing and preserving leather, a suitable polish or dressing may follow the use of the soap.

Such treatment is effective for leather upholstery, leather cases, luggage of all kinds, and handbags. The continued popularity of large shoulder bags for women should point to an obvious market for saddle and leather soaps. Soaps containing solvents should be used with caution, or may even be contraindicated for cleaning items made of artificial or simulated leathers.

It is sometimes said (3) that any well-made neutral soap may be

used for washing leather equipment. Nonetheless, ever since saddle soaps were introduced over two hundred years ago, (4) it has been recognized that good leathers require more or less specialized cleaning agents. As remarked by Smith, (5) the object of a good saddle or leather soap is to remove the dark grease and dirt that gets absorbed and mechanically worked into the pores of the leather without injuring the grain and without detriment to the natural color of the leather.

IN the early days, those responsible for the care of saddles and harness concocted their own soaps and, in many cases, kept the formulas as their own trade secrets. As the use of saddle soaps became more widespread their manufacture passed into the hands of commercial soap makers. Quite typical were the so-called Russian saddle soaps which were quite popular some thirty to forty years ago. According to Stanislaus and Meerbott, (6) such products consisted of rosinated tallow soaps prepared by carefully melting tallow and dissolving 50 per cent of rosin in it. This mixture was then saponified with a 50:50 mixture of potash lye and soda lye (stock of 24° Be.) This soap was allowed to harden and subsequently a small amount of warm water was milled into the mass. The resulting soft soap was then packaged in boxes to show that it was the genuine article.

Before World War II, much of the saddle soap used in this country was imported from England. (7) These products still find wide sale in American stores. This fact requires particular emphasis because, as noted by John, (8) the typical English saddle soap is not designed to impart a high luster, but is intended more for preserving the leather and extending its useful life. These soaps are fairly simple in composition, sometimes containing some free fatty material to impart softening or other beneficial effects to the leather. For instance, according to Smith, (4) an excellent saddle soap made in Great Britain consists of a mixture of 12 parts bleached palm oil, three parts cotton seed oil and two parts rosin saponified with 38° Be. caustic lye. A small quantity of Turkey Red oil is incorporated in the product.

In the opinion of this English authority, the main requirements of a saddle soap are as follows: (a) It must possess a mild but effective scouring action on the leather, i. e. ability to remove dirt, grease, surface dressings, perspiration and the like, (b) It must possess lubricant and "nourishing" properties; that is it must have the ability to leave the leather smooth and silky to the touch and in a fit condition to take a high polish when application of a suitable polish is made, and (c) It must possess good keeping qualities.

IN the United States, and to some extent in England as well, the trend in saddle and leather soap formulation is toward the inclusion of various agents to improve the cleansing action and luster-imparting properties of the products. The trend is indicated in the U. S. Federal Specification for Saddle Soap (P-S-609). This calls for a homogeneous non-separating, non-flowing smooth paste consisting of soap, waxes, and oils in aqueous emulsion. The soap must be of such quality that leather can be cleaned with it readily and thoroughly. When applied to a leather surface, permitted to dry, and rubbed with a soft cloth, the soap should not leave a greasy film or cause objectionable discoloration. The soap should not contain added coloring matter and the odor must be satisfactory to the purchaser. According to the specification, the soap should have the following chemical composition:

		Per cent
Matter volatile at 105°C.	Max.	76.0
Free alkali, as sodium hydroxide	Max.	0.1
Free acid, as oleic acid	Max.	0.3
Alkaline salts, as sodium carbonate	Max.	0.1
Anhydrous soap	Min.	16.0
Unsaponified matter (free fatty oils and wax)	Max.	7.0
Unsaponifiable matter (from wax)	Min.	3.0
Matter insoluble in water	Max.	1.0

As indicated by this specification saddle and leather soap is most popular in the form of a firm paste. These paste soaps are usually packaged in air-tight flat round cans. If possible, the containers should be of a rust proof material, but if this is not possible the inside of the cans and covers should be treated to prevent rust. Saddle soaps are also available in molded cake or bar form, but this type receives neither the demand nor the display accorded the paste soaps. So-called leather soaps in liquid form are now being displayed in many stores. These, however, appear to be soap-stabilized emulsions of neatsfoot oil and other ingredients. A product of this type, with good preservative and softening action, has been described in a review (9) of leather cleaners already published in *Soap and Sanitary Chemicals*.

Soap is, of course, the basic raw material in making these specialized products. This may be a prepared soda-tallow or a Castile type soap or the soap may be formed *in situ*. Palm oil is frequently used and, in Smith's (4) opinion, there seems to be no reason why a straight palm oil should not be used. However, it is desirable that the resulting soap should possess definite emollient properties. Therefore, glycerine should be added or the cold saponification process should be employed. Fats and oils, especially neatsfoot oil, are sometimes added to obtain the desired softening action.

Common custom is now to add a small amount of beeswax, montan or other wax to saddle soaps in order to produce a polish and leave a protective wax film on the surfaces being cleaned. (3) Pointing out that American manufacturers may find it advantageous to increase the proportions of wax, including also a quantity of carnauba wax, John (8) has suggested that the addition of a dry-bright wax emulsion to a saddle soap has interesting possibilities. Wax emulsions suitable for use in soaps have been described in patent specifications, (10) but methods for making such emulsions are also available in the industrial literature. (11)

SOLVENTS are sometimes added to saddle and leather soaps to improve the cleaning action and combat stubborn stains. An excess of solvent should be avoided since this may cause undue drying or defatting of the leather. Smith (5) feels that the addition of

hexalin (cyclohexanol) or tetralin to the ordinary saddle soap formula is an asset because it helps materially to remove grease and dirt from leather. A useful soap may be made by adding 5 per cent of hexalin and 1 per cent of bentonite or other good clay to a well prepared borax soap containing one per cent of free borax. A soap of this sort, says he, is easy to prepare and gives good results. Smith (4) also observes that in Germany solvent soaps are quite frequently crutched with a suitable base soap to make proprietary saddle soaps. These also contain various additives, including waxes, kaolin and glycerine or glycol.

Mild abrasives, like talc and chalk, or colloidal clays, such as bentonite, are sometimes added to saddle soaps. Experiments with colloidal clays have been encouraging and have suggested their use (4) as safe additives to soaps. These clays tend to act as fillers and so render leather less porous and better able to take a good polish.

In view of the greater demand for the paste type of product, it is interesting to note that the most widely cited (5, 7, 12, 13, 14) formula for a saddle soap describes the production of a cake or bar type of cleaner. Based on a saponified mixture of palm oil and rosin, the soap may also contain a small proportion of beeswax or other suitable wax as an optional ingredient. The formula and method are as follows:

	Parts
Palm oil, bleached	14.0
Rosin, light (WW grade)	1.0
Caustic soda, 38°Be.	7.0
Water	35.0-40.0
Glycerine	5.0
Talc	0.2

Melt the palm oil and rosin and saponify the melted mixture by the semiboiled process with the caustic soda solution. After making adjustments to correct excess acidity or alkalinity, stir in the water, glycerine and talc. If desired, 1 to 2 per cent of beeswax or other wax may be added to the soap after it is made. The soap is then framed or is run into molds.

The following formula (5) is basically similar to the above, but contains several additives to yield a more rounded product:

	Parts
Tallow	10.0
Olive oil foots	5.0
Light colored rosin	1.5
Caustic soda 38.6°Be. (33% Na OH)	6.0
Water	34.0
Glycerine	4.0
Hexalin	2.0
Marble dust or French chalk	1.0
Beeswax or montan wax	1.0

The fats and rosin should be properly saponified by the semiboiled process with the alkali dissolved in as little water as possible. When saponification is complete, the glycerine, wax and abrasive should be added with good stirring. When the soap has cooled to about 120°F., the solvent can be added and the mass well crutched or mixed to insure perfect emulsification. It is advisable to mix the hexalin with a little strong soap solution before adding it to the mass, because this provides better emulsification.

A NUMBER of formulas for making saddle and leather soaps of the paste type are available in the technical literature. These range from the fairly simple preparations of the English type to the somewhat more elaborate products containing various adjunct ingredients. In the main, these products are made with a prepared soap as the basic ingredient. This, of course, makes for easier manufacturing procedures and eliminates much of the specialized equipment required for saponification. If ready made soaps are used, saddle soaps are placed within the realm of the average sanitation specialty producer.

Illustrative of the basic English saddle soaps is the following formula as given by John: (8)

Water	6 gal.
Soap	16 lb.
Tallow	20 lb.

Dissolve the soap in the water with heat. Melt the tallow separately and stir it into the hot soap solution. The consistency of soap is varied by the amount of water used; more water being added if a less solid product is desired. The soap may be colored; a pale orange being a suitable tint. A trace of perfume is an optional addition.

Somewhat more elaborate and containing a wax as an added polishing aid, is the formula listed by the same worker:

Water	6 gal.
Potassium carbonate	½ lb.
Soap	12 lb.
Tallow	6 lb.
Natural beeswax	8 lb.

Also of English origin (15) is the following procedure for making a harness soap:

	Parts
Water	250

(*Turn to Page* 91)

Fatty Acid Processing

PART II

LAST month in part I of his article on fatty acid processing, Dr. Brown offered background for this subject by pointing out basic differences among the fatty acids. He discussed the composition of natural fats and fatty oils, and reviewed the methods used for determining the fatty acid composition of a fat. Part II of his paper goes on to discuss modern methods of fatty acid production.

Processing Fatty Acid Mixtures

METHODS of producing the basic fatty acids have been modernized to a great degree. Any natural fat or oil (i.e. triglyceride) must first be chemically "split" or hydrolyzed to obtain the component glycerine and mixture of fatty acids. This hydrolysis has been accomplished by batch autoclave, Twitchell splitting, and now by the present modern continuous high pressure method. In all cases the chemical reaction is between the triglyceride and water to form immiscible phases: the fatty acid and the "sweetwater" which contains the glycerine. In all cases the "sweetwater" is chemically treated and evaporated to obtain crude glycerine which is then distilled to obtain the refined grades. A continuous high pressure splitting column appears and functions as a modern process unit in contrast to the battery of lead-lined tubs and treating tanks required for Twitchell splitting of an equivalent quantity of fat.

Generally speaking, the "split" fatty acid mixture is then distilled for sale as such (e.g. tallow, cottonseed, soybean, peanut, corn, coconut) or for further processing. There are different types of vacuum stills used for this purifying process, but they all produce continuously from a given feed stock a single distillate and a residue. The residues are generally re-distilled in a tar type still which yields a secondary distillate and a residual "pitch." Further processing methods include: hydrogenation, oxidation, polymerization, and various means for separation of mixtures.

Of greatest interest to potash soap manufacturers are the commercial methods for separation of fatty acid mixtures. The classical (and still currently used) method is panning and pressing. The mixed acids are chilled in pans, the solid cakes removed, wrapped in burlap, and pressed in hydraulic presses. The more liquid acids are pressed out, leaving the solid fraction which is repressed in a hot press to remove still more of the liquid acid. Thus the stearic acid and "Red Oil" or oleic acid of commerce have been produced from animal fatty acid for scores of years. There is nothing wrong with this method except that it is messy, a batch operation (each press charge being a batch), subject to errors in human judgment, costly from a labor standpoint, and adaptable only to fatty acid mixtures (such as tallow fatty acid) which will solidify at reasonably reduced temperatures to cakes which can be handled. For the last reason the method is definitely limited in its application.

A more modern approach to separation of liquid from solid acids is the "Emersol" process, which is operating continuously (24 hours per day) for the separation of various mixed acids. This process consists simply of continuous fractional crystallization of solid fatty acids from solvent solutions. Methanol is one of many solvents that can be used.

Figure 1 shows the continuous multi-tube crystallizer in which the solid acids are slowly crystallized from the solution. Also the filter room in which a rotary filter continuously filters the solid acids which are then continuously conveyed to a melter. From there the solid fraction is pumped to a stripping still (shown at right) for solvent removal. The filtrate containing the liquid unsaturated acids is likewise pumped through a stripping still which completely strips off the solvent from that fraction.

Fatty acid mixtures of all types can be processed in this manner without limitations as in the case of the pressing method. The solvent method is especially adapted to separation of unsaturated from saturated acids because of their great difference in solubility in selected solvents. The method is limited, however, in regard to separation of saturated acid mixtures since the solubilities of saturated acids in selected solvents do not vary widely enough from one chain length to another.

The fatty acid industry has an answer to the problem of separation of mixed saturated acids in the form of fractional distillation units.

Fractional distillation is capable of efficiently separating fatty acids of different chain lengths, but is not capable of separating saturated from unsaturated acids of the same chain length. The combination of the two methods provides means for complete

* Before the Soap & Detergent Mfgrs. Assn., New York, January 27, 1948.

By Robert F. Brown*

Emery Industries, Inc.

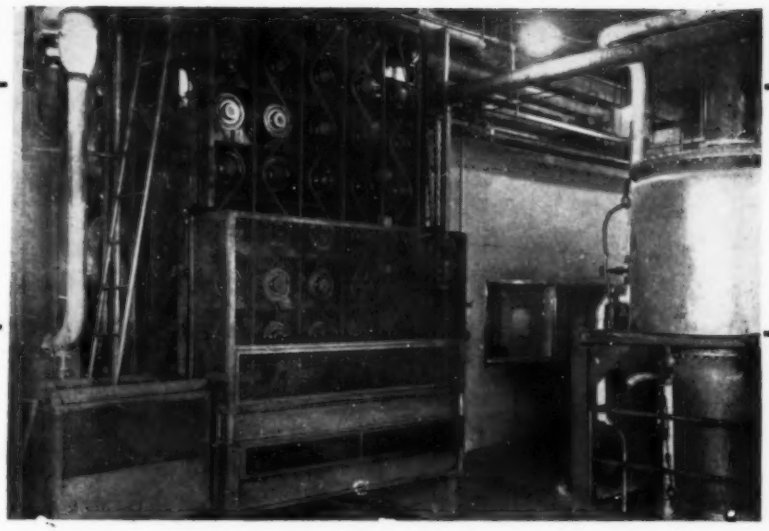


Figure 1: Continuous multi-tube crystallizer in which solid acids are slowly crystallized from the solution. At right is the stripping still for solvent removal.

fractionation although this might not be economically feasible in many instances. Other methods of separation of fatty acid mixtures are in the process of development and will be used commercially as our industry adapts them to our needs.

A few illustrations will indicate what is now being accomplished with all these commercial methods of processing and separating fatty acid mixtures and what can reasonably be expected in the future. For the sake of illustration, we shall in each case start with the distilled mixed acids derived from various natural fats and oils. The original composition in each case is regarded as reasonably representative of each type of material.

Figure 2 illustrates various products obtainable from tallow fatty acid. The solid acid mixture resulting from hydrogenation is being manufactured and sold on a large scale today. The fractional distillation of this mixture into reasonably pure fractions of palmitic and stearic is likewise in commercial practice. The Emersol separation is our current commercial method of producing stearic and oleic acids. The dimerization of the tallow fatty acid will be a method of producing a low yield of "dimer" acid and a commercial mixed acid of light color characteristics and free of linoleic acid. This linoleic free mixture will have excellent properties for high quality soda soaps due to the enhanced oxidation stability resulting from elimination of the linoleic acid. The mixture can also be separated by the Emersol process to yield reasonably pure oleic acid. Market evaluation of the pure oleic acid is in advanced stages and

FIGURE 2

Products Obtainable from Tallow Fatty Acid

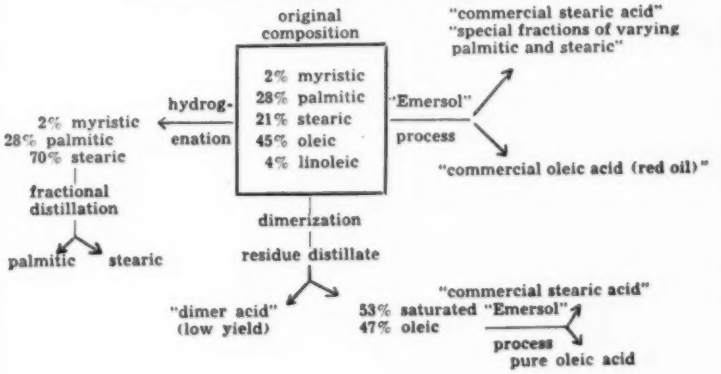


FIGURE 3

Products Obtained from Cottonseed Fatty Acid

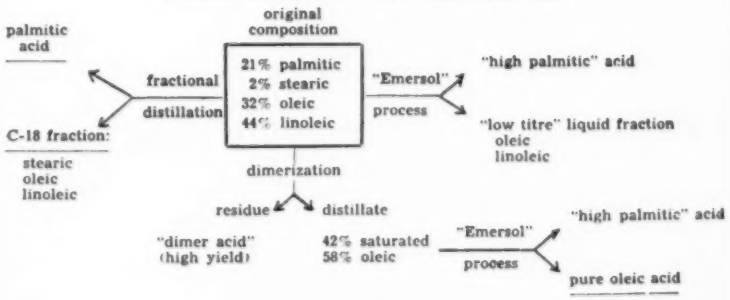
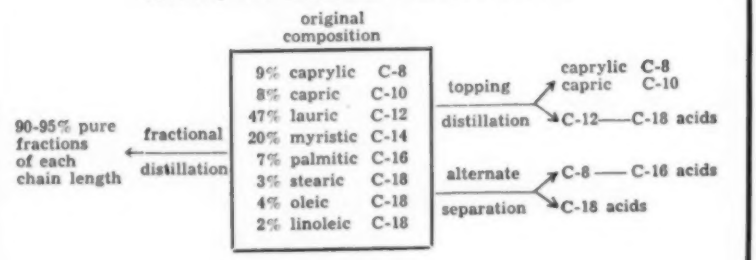


FIGURE 4

Products Obtainable from Coconut Fatty Acid



results are exceeding expectations.

The absence of the 8-12 per cent of linoleic acid currently contained in commercial oleic acid makes a drastic difference with respect to oxidation stability, color stability and resistance to rancidity. One of the most convincing demonstrations of this improved stability is the fact that the material shows little if any more discoloration upon vigorous heating than high quality stearic acid. Such color stability is of extreme importance in the manufacture of organic derivatives such as esters at high reaction temperatures. It is believed that manufacturers of liquid soaps and shampoos will benefit greatly from the practically odorless quality as well as the odor and color stability.

FIGURE 3 illustrates various products obtainable from cottonseed fatty acid. The fractional distillation and the Emersol separation are both in commercial operation. Of course the stearic acid in the C-18 fraction is inevitable whereas solvent separation does permit more complete "destearination" and a consequent lower titre. It is believed the rather complete removal of saturated acids may be of great importance to liquid soap manufacturers. This has been pointed out by H. Kranich in a recent article on "Clarity of Liquid Soaps." (SOAP AND SANITARY CHEMICALS, XXIII, II, 33, 1947). The dimerization treatment in this case produces a high yield of "dimer" acid and a distillate which can then be solvent-separated to yield again the pure oleic acid and a high palmitic fraction. Again in this instance the distillate should be of exceptional value for high quality soda soaps as well as other uses due to the absence of easily oxidizable linoleic acid.

Soyabean fatty acid is less attractive as a starting material for fractional distillation but yields a well destearinated fraction upon solvent separation. In this case the linoleic acid content is higher and there is some linolenic acid. It is doubtful whether the slightly increased percentages of these acids (by virtue of removal of the saturated acids) is any more objectionable than the percentages present in distilled soyabean fatty acid which itself is so commonly used in preparation of potash soaps. It is being produced commercially now.

Coconut fatty acid is also separable into interesting fractions as illustrated in Figure 4. The residual coconut acids from the topping distillation are of quite general interest to the soap and synthetic detergent industry because of the possible skin irritating action of the caprylic and capric acids. Unanimous opinion in this regard seems to be lacking. This topping operations has been in commercial operation for several years, the capric and caprylic acids having been of considerable importance during the war. The fractional distillation has also been in commercial operation for several years although on a considerably lesser scale. The alternate separation illustrated is planned for early commercial operation. The elimination of the stearic, oleic, and linoleic acids offers important improvement for several specific uses. It is believed that such a modification will be desirable for at least certain types of liquid soap formulation due to the absence of these higher acids.

It should be apparent from these illustrations that the surface has only been scratched with respect to commercial modifications and fractions obtainable from natural fatty acid mixtures.

Commercial Utility

THE industry is familiar with advantages of fatty acids vs. neutral oils for liquid soaps from the standpoint of uniformity, ease of processing, and relative cost. It now appears that present and future special fractions of fatty acids will represent such additional quality and performance advantages that neutral oils will be far less desirable.

Since our industry's products are consumed by scores of major industries, for hundreds of specific purposes, we find it difficult to be specialists in all fields of use. However, practical laboratory evaluation is a necessary guide for development, so considerable effort is expended in this direction. Consequently it is possible to convey some idea of the commercial utility of certain of these newer fractions.

There are many advantages to the rather complete destearination of liquid acids for use in liquid soaps. The saturated acids up to a certain concentration do not seem to greatly affect viscosity or real soap content attainable in a liquid soap. However, they do seem to be related to cloudiness under certain conditions and certainly do not contribute to satisfactory performance in hard water.

In our comparisons of fatty acids for liquid soap formulations we run Stormer viscosities over a range of concentration and note particularly the real soap content at a viscosity of three units. This seems to be just short of the gel-point and represents to us the maximum permissible real soap content in each formulation. Using this test it has been observed that the linoleic-free oleic acid will permit a real soap content as high if not higher than that permitted by current commercial oleic acid. Similarly the de-stearinated vege-

(*Turn to Page* 93)

Outlook For Palm Oil

By John R. Skeen
Market Research Department
Foster D. Snell, Inc.

PALM oil has almost been eliminated as a soap-making raw material as a result of the war and the extraordinary high level of the domestic economy. No material change in this situation is anticipated in 1948.

In the period 1936-39, the annual consumption of palm oil in soap amounted to 103 million pounds, 34 per cent of the total. At that time, palm oil represented nearly 10 per cent of all the slow lathering, hard oils used in soap. In 1947, only 1 million pounds were made into soap and palm oil ceased to be a factor in this industry.

During the years 1936-39, Africa supplied the world with 530 million pounds of palm oil annually, and 425 million pounds originated from Sumatra. Of the supply reaching the United States, 20.8 per cent was imported from the Belgian Congo and Nigeria (68.4 million pounds per year), and 76 per cent came from the Netherlands Indies (251 million pounds). In pre-war years, the United States obtained about 13 per cent of the African supply and about 60 per cent of the Sumatran exports. The situation in the Indies becomes of greatest domestic interest.

The military activities of the Japs were a critical factor in the world supply of oils, particularly coconut and palm oils. Exports from Sumatra stopped in 1942 and there was little chance of increasing imports from Africa in competition with the established Eu-

(*Turn to Page* 93)

PALM OIL. STATISTICAL SUMMARY

unit: million pounds

	Consumption						*Price*	*Exports*	*Imports (units)*[7]				*Stocks*
		Soap											
	Apparent total[1]	*Units*[2]	*% of total*[3]	*% of "tallow" oils*[4]	*Foods units*[2]	*Tin & Terne units*[2]	*Drums N. Y. lb.*[5]	*Palm & P. K. units*[6]	*Total*	*Belgian Congo*	*Netherlands Indies*	*Nigeria*	*End of period units*[8]
1934	183.2*	154.7	84.5	14.6	17.3	12.1	5.4	1.4	155.5	27.5	99.0	19.7	77.1
5	293.0*	87.3	29.7	8.8	117.8	17.1	7.7	12.1	297.6	48.8	188.3	39.1	69.6
6	309.2*	78.5	25.4	7.8	170.4	n.q.	7.8	5.3	338.8	42.3	251.5	31.4	93.9
7	339.2*	141.4	41.7	13.6	125.7	30.7	8.6	10.8	411.1	50.3	285.6	61.8	155.0
8	270.0*	91.6	33.9	8.8	115.4	18.4	6.8	5.5	271.3	27.1	228.3	12.3	150.8
9	303.1	102.1	33.7	8.7	115.4	29.1	7.0	13.9	288.6	32.7	237.0	15.9	133.4
40	179.7	84.9	47.2	6.8	40.3	31.1	7.2	23.9	225.0	32.7	180.0	4.8	155.7
1	290.5	129.9	44.7	8.2	93.2	42.1	9.7	32.3	308.1	42.3	259.7	5.4	139.9
2	128.6	55.9*	43.5	3.3	23.9	20.5	11.9	1.6	77.9	35.8	40.7	1.2	86.8
3	64.8	32.6	50.2	2.1	0.9	28.1	11.6	19.2	59.6	52.4	—	7.2	61.9
4	60.5	19.7	32.6	1.1	—	35.7	11.4	13.1	71.5	46.4	—	22.3	59.3
5	71.5	24.5	34.3	1.5	—	37.3	11.4	17.8	66.1	36.8	—	26.4	36.1
6	50.9	7.4	14.5	0.6	—	36.4	12.3	7.4	37.9	35.2	—	2.7	15.1
1947	41.5*	1.0*			0	40 *		0.4*	57.2*	53.1*	0	3.8	23.3
1Q	9.53	0.4	4.2	0.1	—	9 *	21.8	0.2	11.6	11.6	—	—	15.0
2Q	12.29	0.2	1.6	0.0	—	12 *	n.q.	0.0	15.9	15.9	—	—	17.3
3Q	10.50	0.3	2.8	0.1	—	10 *	n.q.	0.0	22.7	18.6	—	3.8	23.1
4Q	9.2*	n.a.	n.a.	n.a.	—	9 *	n.q.	0.2*	7 *	7 *	—	—	23.3

* approximate

[1] crude and crude equivalent of refined; 1939-1947: Fats & Oils Section, Department of Commerce, courtesy Mrs. A. M. Goldsmith; 1934-1938: derived and not "official"

[2] *Animal and Vegetable Fats and Oils*, Department of Commerce, 1934-1940; *Facts for Industry*, Series M17-7-05, 06, 1941-1946; *Facts for Industry*, series M17-2, 1947

[3] units consumed in soap as per cent of total apparent consumption of palm oils (crude equivalent)

[4] "tallow class" oils: tallow inedible, tallow edible, greases, whale and fish oils, palm oil, lard, rendered pork fat, inedible animal stearine; palm use in soap as per cent of this total use in soap

[5] Niger 1934-1943; Congo 1944-1947; casks before 1940, drums 1940 and after; *The Fats & Oils Situation*, Department of Agriculture, FOS-106, Jan.-Feb. 1946; for 1946-1947, prices from Fats & Oils Section, Department of Commerce

[6] palm plus palm kernel (not separately reported); *Foreign Commerce & Navigation*

[7] the three major producing sources given; the total includes re-exports from U.K., Netherlands, etc., *Foreign Commerce & Navigation*

[8] palm crude plus crude equivalent of refined (7% refining loss); source, ([1])

[9] *The Fats & Oils Situation*, Department of Agriculture, FOS-108, May-June 1946, p. 16

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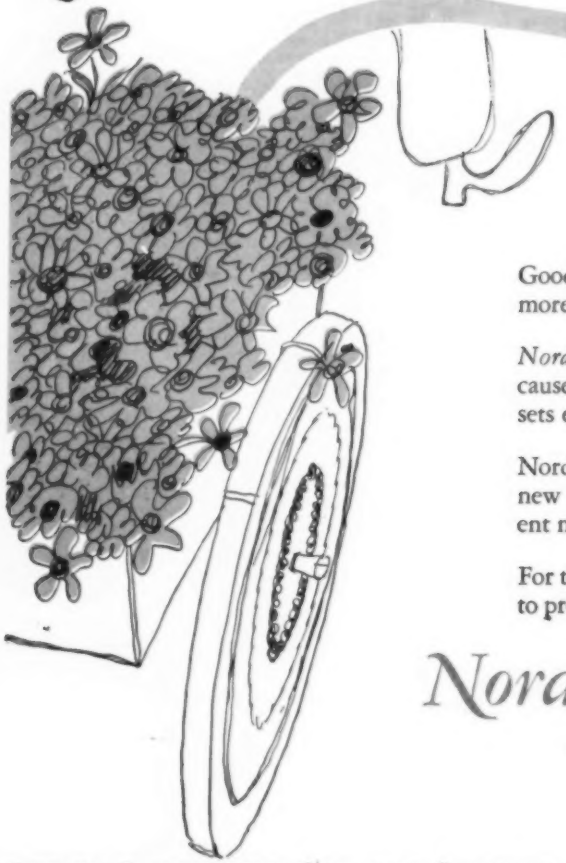

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TRADE NEWS. . . .

Waverly Soap Reorganizes

Waverly Soap & Chemical Co. of Philadelphia was recently recapitalized and incorporated under the name of Waverly Manufacturing Co., Inc., doing business at 2133 Orthodox St., Philadelphia. The firm manufactures soaps, cleansers and sanitary chemicals and is equipped for private label packaging service. Three partners of the new company are technical men. One being a chemist, another a pharmacist and the third a pharmaceutical chemist.

Lever Advt. Head Talks

An address, "A Philosophy of Advertising for 1948" by John R. Gilma, vice-president in charge of advertising for Lever Brothers Co., Cambridge, Mass., was scheduled to be given before the Marketing Conference of the American Management Association at the Hotel New Yorker, New York, Mar. 19.

Miller Acting Assn. Sec.

The appointment of J. Malcolm Miller as acting secretary of the Association of American Soap & Glycerine Producers was announced Mar. 1 by George A. Wrisley of Allen B. Wrisley Co., Chicago, president of the Association. Mr. Miller will serve pending decision by an association committee as to a successor to Roscoe C. Edlund, whose resignation as secretary and manager of the association was announced last month. A member of the staff of the A.A.S.G.P. since 1934, Mr. Miller has been in charge of organization finances, office management and personnel. Previously, Mr. Miller, who studied business administration at DePauw and Columbia Universities, held executive positions with National Credit Office, the National Park Bank of New York, General Motors Acceptance Corp., Paramount Publix Theatres and Metro-Goldwyn-Mayer. He is a member of American Trade Association Executives, Trade Association Executives of New York, National Office Managers Association, Lions International and the 7th Regiment of New York. He resides with his wife and two children at Irvington-on-Hudson. Serving on the committee to choose Mr. Edlund's successor are E. H. Little of Colgate-Palmolive-Peet Co., N. S. Dahl of John T. Stanley Co., and Mr. Wrisley.

J. MALCOLM MILLER

C. of C. Elects McElroy

Neil H. McElroy, vice-president and general manager of Procter & Gamble Co., Cincinnati, was recently elected to the board of directors of the Chamber of Commerce of Cincinnati.

C.D. & C.A. Spring Party

Cancellation of its reservation for the annual spring party of the Chicago Drug and Chemical Assn. at the Drake Hotel, May 15, is being contemplated unless a sufficiently large attendance can be assured in advance, it was announced by the Association in a recent bulletin to members. A minimum of 200 couples at $12.50 per person is needed.

Counts Soap Relocates

James Counts Soap Co., St. Louis, is now in new quarters at 712 N. 2nd St., it was learned recently. The company has leased a three story building at the N. 2nd St. address for five years, having sold the property at its former address of 2133 Cass Ave., following the death of E. J. Stoffregene, who was a joint owner of the business. James R. Counts is now conducting the business as sole owner.

Committee D-12 To Meet

The annual meeting of Committee D-12 (soaps and other detergents) of the American Society for Testing Materials will be held Tuesday and Wednesday, Mar. 23-24, at the Park Central Hotel, New York, it was announced early this month by B. S. Van Zile, chairman. A program of section meetings to extend over a day and one-half, a luncheon and general meeting on the second day are to be the highlights of the gathering.

Bok Award to Fels

Samuel S. Fels, president of Fels & Co., received on Mar. 1 the $10,000 (Edward W.) Bok Award in recognition of outstanding service to the city of Philadelphia. Mr. Fels is 88 years old and a native of Yanceyville, N. C. He is also president of Paschall Oxygen Co. The award was founded in 1921 by the late Edward W. Bok, well known author and journalist.

Crane Traffic League V.-P.

D. W. Crane, of the general traffic department of Colgate-Palmolive-Peet Co., Jersey City, N. J., was recently named vice-president of the New Jersey Industrial Traffic League. Mr. Crane also serves as chairman of the League's executive committee.

ORGANIC SEQUESTERING AGENT

RN-WATER SOFTENER A

PROPERTIES

Straw-colored aqueous solution (density—1.21).

COMPOSITION

A polyamino carboxylic acid salt.

USES

When used in combination with fatty acid soaps and certain synthetic detergents this organic type lime soap dispersant and solubilizer enhances foaming and detergency properties, inhibits flocculation in hard water and improves rinsing. Many types of liquid shampoos and various concentrated soap solutions are clarified on addition of this product.

Cosmetic Chemists To Meet

The annual meeting of the Society of Cosmetic Chemists will be held Wednesday, May 19, in the Music Room of the Biltmore Hotel, New York. It is to be an all-day affair, with a luncheon between the morning and afternoon sessions. Although the meeting is being held at the same time as the Toilet Goods Association's annual convention, the meeting of the T. G. A.'s scientific section will not conflict with that of the Cosmetic Chemists since the scientific section meets on the following day, May 20. Marcel J. Suter, chairman of the entertainment committee of the Society of Cosmetic Chemists, advises that the program for the meeting will be announced shortly.

Cuts Shave Cream Prices

A reduction of 16 per cent in the price of its shaving cream was announced Feb. 18 by J. B. Williams Co., Glastonbury, Conn., as a result of the recent sharp drop in the price of oils and fats. According to Everett B. Hurlburt, president, the new price means a saving of about eight cents on a 50-cent tube of shaving cream. He stated that his company had bought enough oils and fats on the recent market drop to continue lower prices for many months.

New Kelite Branches

The opening of a new sales office in Columbus, O., with J. F. Riley as manager, and another in Cincinnati, with J. T. Nolan in charge, was announced recently by Kelite Products, Inc., Los Angeles manufacturer of industrial chemical cleaning materials.

A. I. C. Meets May 7

A change in the date of the annual meeting of the American Institute of Chemists from May 8th to Friday, May 7th was announced Feb. 18th by Foster Dee Snell, president of the Institute. The change was made to enable the New York Section of the American Chemical Society to meet jointly at the Institute's silver anniversary dinner at the Waldorf-Astoria Hotel, New York. At the dinner, the Institute will present its gold medal to Dr. Charles Allen Thomas, president of the American Chemical Society and executive vice-president and technical director of Monsanto Chemical Co., St. Louis.

Right: Richard R. Deupree, president of Procter & Gamble Co., Cincinnati, receiving Army's Exceptional Civilian Service Award from Secretary of the Army, Kenneth C. Royall in a ceremony at the Pentagon Building, Washington, D. C., during February.

A. O. C. S. Fat, Oil Course

A short course in fat and oil technology will be given on Aug. 16-21 at the University of Illinois, Urbana, under the sponsorship of the American Oil Chemists' Society. Enrolment in the course, registration fee for which will be $10, will be limited to 50. Emphasis will be placed on technology of edible vegetable oils. Field trips to nearby plants will be a feature of the week's program, which will include 20 lectures by authorities in vegetable oil production, marketing, processing and utilization. J. P. Harris, manager of the Chicago office of Industrial Chemical Sales division, West Virginia Pulp and Paper Co., is chairman of the committee in charge of arrangements.

E. B. Speiden Retires

Eben C. Speiden, senior vice-president and works manager of the Isco Chemical Division, Innis, Speiden & Co., New York, recently retired from active duty at the Niagara Falls, N. Y., plant. E. T. Ladd, general superintendent and chief chemist of the division, has been appointed works manager. Dr. Ladd has been with the firm about 32 years.

"Pepsodent" Adv. Changes

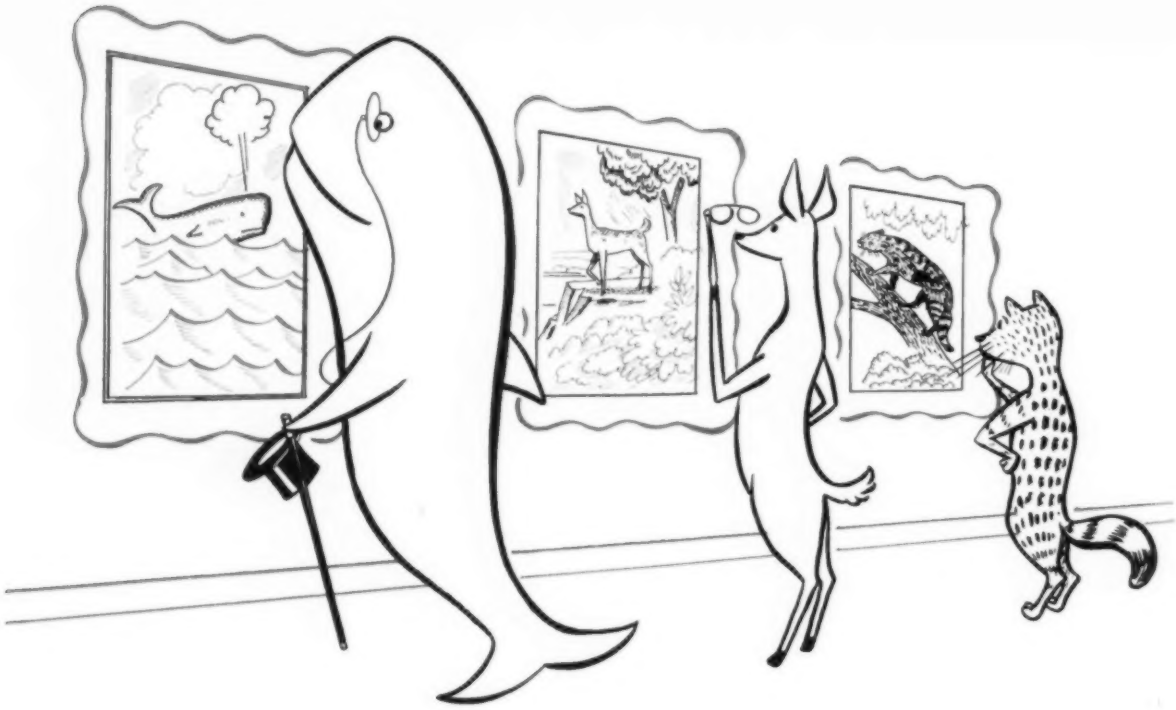
Changes in the size of its advertising budget (upwards), in advertising media and in the type of advertising copy used by Lever Brothers Co., Cambridge, Mass., on behalf of its "Pepsodent" toothpaste are discussed in an article on the dentifrice in the Feb. 6 issue of *Tide*, magazine of advertising. "Pepsodent's" 1948 advertising budget has been increased by 25 per cent and in an effort to increase the amount of advertising, insertions will switch from color to black and white. Advertising copy will be built around the careers and lives of "ordinary, everyday citizens" according to *Tide*. In addition, readers are invited to send in pictures and testimonials which will be paid for at regular professional model rates.

Two New Dish Washers

Two new dishwashing compounds have been added to the "Certified" line of cleaning compounds made by Laundry Products Corp., Brooklyn, according to a recent bulletin of the company. One is a mechanical dishwashing compound and bears the designation "Formula L. 77"; the other is a medium titer soap powder for hand dishwashing called "Formula D. 66."

Kalish Joins Adv. Cosmetics

Joseph Kalish, technical editor of *Drug & Cosmetic Industries* magazine and production manager for several cosmetic houses, was recently



True reproductions of the originals—

PENICK'S Amberscent, Muscent and Civescent

These Penick synthetic fixatives are new triumphs of our laboratory technicians and chemists.

AMBERSCENT, MUSCENT and CIVESCENT are being accepted with enthusiasm by the perfume industry and are daily gaining favor and popularity with those who are using them. They are "True Reproductions Of The Originals," adding that lasting touch so often lacking in the usual types of synthetics.

Here are several of the outstanding features of AMBERSCENT, MUSCENT and CIVESCENT:

They replace the "absolutes" (usual concentration 4 oz. to 1 gal.) pound for pound. They are designed to eliminate the tedious "tincture method." No ageing is necessary. They are soluble in alcohol or other solvents. A 3% solution will prove their persistence and intense power.

Write for further details.

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S. B. PENICK & COMPANY · ASHEVILLE · NEW YORK · CHICAGO ·

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appointed chief chemist and production manager of Advanced Cosmetics, Inc., Long Island City, N. Y.

Show New Hunnewell Items

The first of a series of sales meetings to introduce two new products that have been added to the company's line was held by Hunnewell Soap Co., Cincinnati, Mar. 1. Sixteen branch managers from the Middle West attended the Cincinnati meeting, at which "Meterfeeder," a new mechanical dishwashing compound, and "Foamy Formula Forty," a new surface active agent, were shown and explained. In addition, the new equipment purchased for the production of the latter item was demonstrated to the gathering. C. F. Young was the moderator of a panel on credit, while Leslie Webb, president of Hunnewell, discussed plans for the expansion of the sales force and the plant. Similar meetings are to be held in the East, South and Far West.

P&G Changes Benefits

Procter & Gamble Co., Cincinnati, recently revised its employee expansion and benefit plan in two respects, effective Jan. 1. Under the modified plan, there will be no contributions on the part of the employee, but monthly payments borne in full by the company will be paid to eligible employees for life after retirement. The employees will continue to contribute one per cent of their wages to the government for social security benefits. The new disability plan increases benefits. Several amendments have also been added to the profit sharing plan and the guarantee of regular employment plan, which round out the coverage of P. & G. security plans for employees.

Vandewater Joins MM&R

John I. Vandewater, formerly of the Dow Chemical Co. New York office, has joined Magnus, Mabee & Reynard, New York essential oil house, it was announced late in February. Mr. Vandewater is a graduate of Syracuse University and served in the recent war in the European and South Pacific theatres.

Pissaro Chiris Sales Head

Frederick E. Shoninger, president of Antoine Chiris Co., New York essential oil firm, announced late in February that Andre Pissarro has joined the firm as sales manager. Mr. Pissaro, who is a native of Paris,

PISSARO

France, has been connected with the essential oil and aromatic chemical fields for many years. He fills the vacancy left by Albert V. Henissart, who died a few weeks after his appointment as vice-president in charge of sales for Chiris. Mr. Pissaro recently returned from an extended tour of South America.

Cosmetic Sales Off

Estimated sales of perfumes, cosmetics and other toilet preparations, excluding toilet soap for 1947 declined 2.6 percent below the record set in the previous year to $682,100,000, according to a recent release from the Toilet Goods Association, Inc., New York. Sales have nearly doubled in the period from 1938 to 1946, the TGA figures indicate. Sales of non-taxable items such as dentifrices and shaving creams showed a normal increase during 1947, and sales of certain other non-taxable items such as shampoos, showed considerable gains, according to the TGA's figures.

Sample Soap in Phila.

Distribution of regular size cakes of "Physicians' and Surgeons' Soap" as samples to 5,500 Philadelphia families was undertaken last month by Physicians' Supply Co., Cincinnati. In making the announcement of the sampling, W. W. Carty, who was recently named sales manager of the company, stated that the campaign was part of a program to celebrate the 60th year in which the soap has been in general use and to increase sales in the Philadelphia area.

Lever Emersol Plant

Lever Brothers and Unilever, Ltd., London, Eng., awarded a contract for designing and construction of a plant using the "Emersol Process" for the production of stearic and oleic acids to the chemical plants division of Blaw-Knox Co., Pittsburgh, it was announced Mar. 3. The plant will be located in England and erection will be under the direction of Blaw-Knox engineers. The amount of the contract is about $350,000.

Bon Ami Earnings Down

Bon Ami Co., New York, recently reported a net profit for 1947 of $949,927, equal to $4.38 a share on the class A and $2.68 a share on the class B stock, compared with a 1946 net of $1,567,682, or $7.64 a share on the class A and $4.22 a share on the class B stock.

Kelite Advances Coleman

Kelite Products, Inc., Los Angeles producers of industrial cleaning materials, announced late in February the appointment of Clarence Coleman as regional manager of the Arizona-Nevada district with headquarters in Phoenix. He has been with the company since 1943, and previously represented Kelite in the Southern Arizona and western New Mexico district.

AMA Packaging Conference

The 17th annual Packaging Exposition and conference on packaging, packing and shipping, sponsored by the American Management Association, New York, will be held in the Cleveland Auditorium, Apr. 26-30.

Dreyer Names Matthieu

The appointment of N. Cay Matthieu as their representative in Ohio, Michigan and Western Pennsylvania, was announced Mar. 3 by P. R. Dreyer, Inc., New York essential oil and aromatic chemical firm.

A NEAT TRICK IF YOU CAN DO IT....

. . . AND it's a neat trick if you can make your household spray sell successfully *without* benefit of appropriate odor. But how many spray manufacturers can do that? Yours may be the most effective spray on the market, but unless it has an odor that is pleasant—or at least inoffensive—it will have a hard time bucking competitive products that do enjoy this advantage. Consider this: If you are planning to introduce a new spray, or if you are now marketing one that has failed to develop satisfactory repeat demand, let our laboratories help you with the selection of an appropriate fragrance. A FRITZSCHE masking agent of proven effectiveness and negligible cost could mean the difference between success or failure of your product. Write for free pamphlet: "Insecticide Spray Perfumes and Deodorants".

FRITZSCHE *Established* 1871 *Brothers, Inc.*

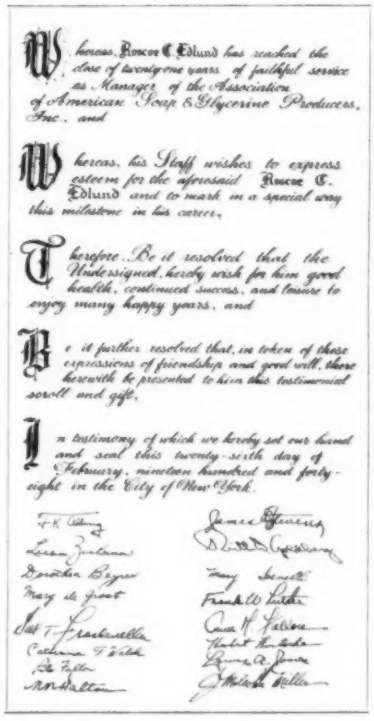
PORT AUTHORITY BUILDING, 76 NINTH AVENUE, NEW YORK 11, N. Y.

BRANCH OFFICES *and* *STOCKS: *Atlanta, Georgia, *Boston, Massachusetts, *Chicago, Illinois, Cincinnati, Ohio, Cleveland, Ohio, Dallas, Texas, Detroit, Michigan, *Los Angeles, California, Philadelphia, Pennsylvania, San Francisco, California, *St. Louis, Missouri, *Toronto, Canada and *Mexico, D. F. FACTORY: Clifton, N. J.

Chi. Purch. Agents' Show

Soap and sanitary chemicals were displayed at a trade show staged by the Purchasing Agents Association of Chicago at the Hotel Sherman, Chicago, last month. Among the exhibitors were: Turco Products, Inc., Los Angeles, showing their powdered and liquid industrial hand soaps and floor waxes. George A. Keane was in charge of the booth. Solventol Chemical Products, Inc., Detroit, whose "Solventol No. 2," a general, all-purpose cleaner, and "1 x," a heavy duty degreaser for industrial operations, were featured. John J. Higgins, Chicago district manager of the company's bulk division, represented the firm at the show. Oakite Products, Inc., New York, demonstrated a new emulsion cleaner for use in pressure spray washing of metals, an all-purpose cleaning and deodorizing agent, bactericides and other related products for plant sanitation. A. A. Becker and T. A. Rink were in charge. G. H. Packwood Mfg. Co., St. Louis, displayed "Pax" industrial hand cleaners, "Paxall," a new, all-purpose synthetic cleaner, "Paxsolv," a new waterless cleaner and a line of soap dispensers. In charge was J. W. Reilley, Chicago sales manager. Lightfoot Schultz Co., New York, featured its industrial soaps and lotions and dispensers. J. D. Compton, Chicago manager, assisted by L. D. Kahn, represented the company. Sanitary Institute of America, with Edward Szold, manager, in charge, explained at its booth the services of its 94 member companies in supplying sterilized wiping cloths to specification for sanitary maintenance. Pesticide Co., Chicago, displayed at its booth its line of insecticides, disinfectants, fumigants and other sanitary chemicals. Visitors to the booth were given an explanation of the company's service program.

Discussing sanitation conditions in the Chicago area, H. C. Kaufman of Pesticide Co., pointed out that interest in plant sanitation in Chicago had increased greatly since the release by the U. S. Public Health Service of its findings on health and sanitation in all phases of commercial activities in Chicago. Manufacturers of cleaning and maintenance products and pest control operators, according to Mr. Kaufman, report that their businesses have grown considerably as a result of the publication of the U. S. Public Health Service survey. The survey, Mr. Kaufman stated, has awakened management to the necessity for pest control programs in factories and for the reduction of the incidence of communicable diseases stemming from unsanitary conditions.



Whereas, Roscoe C. Edlund has reached the close of twenty-one years of faithful service as Manager of the Association of American Soap & Glycerine Producers, Inc., and

Whereas, his Staff wishes to express esteem for the aforesaid Roscoe C. Edlund and to mark in a special way this milestone in his career,

Therefore, Be it resolved that the Undersigned, hereby wish for him good health, continued success, and leisure to enjoy many happy years, and

Be it further resolved that, in token of these expressions of friendship and good will, there herewith be presented to him this testimonial scroll and gift,

In testimony of which we hereby set our hand and seal this twenty-sixth day of February, nineteen hundred and forty-eight in the City of New York.

Above: The engrossed resolution presented to Roscoe Edlund at a dinner in his honor given by the staff of the Association of American Soap & Glycerine Producers, at the Ambassador Hotel, New York, Feb. 26. At the same time the staff presented Mr. Edlund, who has retired after 21 years as secretary of the Association, with a large, round silver platter appropriately inscribed.

Chicago Renderer Expands

Additions to two of the plant buildings of Darling & Co., Chicago rendering concern, are now under construction at 1239 and 1446 W. 46th St., Chicago, it was learned last month. Each building is three stories high, of brick and reinforced concrete construction and will provide a total increased floor space of about 175,000 square feet. The company produces soap grease, fertilizer and related products.

P. & G. Samples "Shasta"

Samples of "Shasta," a new cream shampoo made by Procter & Gamble Co., Cincinnati, were received in the New York area during the middle of February. The samples, having a net weight of .75 ounces, are packed in round white jars with blue tops on which the words, "a gift from Procter & Gamble" and the name of the product appear. The outer wrapping is a red and white box 2⅛ x 2⅛ x 1½", the sides of which are printed in candy stripe fashion. A circular explaining how to use "Shasta" and carrying several panels devoted to sales messages, was included. "Shasta" will be sold in three sizes at drug, department and 10 cent stores.

Degen Forms Own Oil Firm

George Degen, former treasurer and director of Brown Oil & Chemical Corp., New York, has organized his own company, George Degen & Co., with offices at 111 Broadway to act as brokers in all types of marine, animal and vegetable fats and oils, both imported and domestic. In addition, the company will also handle imports of miscellaneous commodities primarily from the Far East and South America. Previously, Mr. Degen, a graduate of New York University, had been with W. R. Grace Co., New York, leaving that firm in 1942 to go with the War Production Board as chief of the high lauric acid oils and palm oil division. Later he was transferred to the Board of Economic Warfare. In 1943, he became affiliated with Brown Oil & Chemical Corp., remaining there until last year.

Columbia Chem. Changes

A number of changes in personnel were announced recently by the Columbia Chmical Division of Pittsburgh Plate Glass Co., Pittsburgh. Robert M. Simpson, who has been connected with the company's sales organization since 1944, has been appointed district sales manager with headquarters in Chicago. Brooks M. Dyer has been named assistant district sales manager at St. Louis. Formerly he was sales representative in the Phila-

ATLANTIC PETROLEUM CHEMICALS

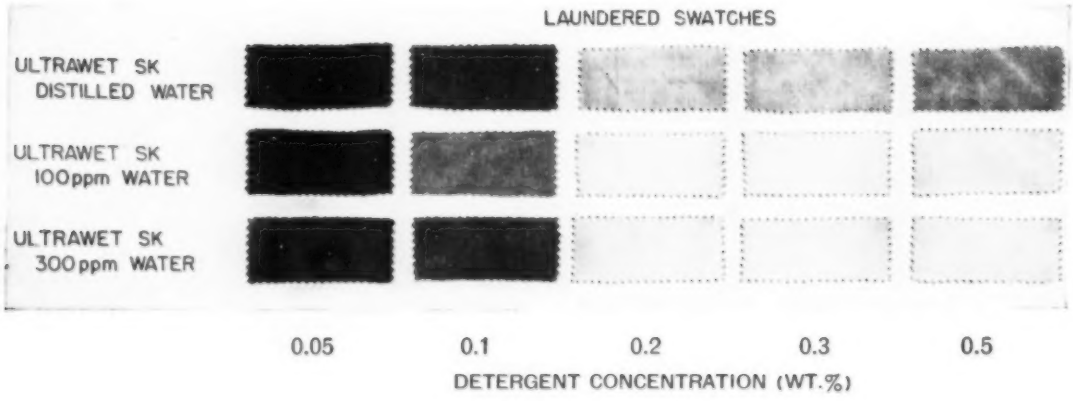
ULTRAWET K's

Is your detergent efficient in all kinds of water?

• If not, it will pay to investigate Atlantic's new Ultrawet SK. The efficiency of this improved detergent actually increases as water becomes harder. As shown below, Ultrawet SK is even more effective in water with a hardness of 300 ppm than in distilled water. *It eliminates the trouble and expense of water softening.*

• Ultrawet SK is one of the new K series of alkyl aryl surface-active agents. This family is the latest development of an organization that has been producing superior detergents and wetting agents for over 10 years. Ultrawet K's are backed by Atlantic's great research facilities. They are now available in quantity in the following types:

Physical form	*Wt. % Active Sulfonate—min.*
Ultrawet K (flakes)	**85**
Ultrawet 30K (liquid)	**25.5**
Ultrawet SK (beads)	**35**



Picture shows wool detergency of Ultrawet SK. Wool swatches impregnated with a synthetic soil are washed in a standard launderometer. The wash solutions consist of stated concentrations of detergent and water of type indicated. Tests are conducted for 20 minutes at 105° F., and followed by 2 rinses.

For samples, further information and quotations, contact

THE ATLANTIC REFINING COMPANY

CHEMICAL PRODUCTS DIVISION

260 South Broad Street, Philadelphia 1, Pa.
Chamber of Commerce Building, Pittsburgh, Pa.
Hospital Trust Building, Providence 1, R. I.

delphia district for five years. C. C. Thompson, credit manager, continues in that post and also becomes office manager at the Columbia division headquarters in Pittsburgh. Appointed manager of the order and service department, is Paul R. McHail, who has been with the firm since 1946.

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P. & G. Man Dies

Arthur E. Connors, Sr., a member of the machinists division staff of Procter & Gamble Company's plant on Staten Island, N. Y., for 35 years, died Feb. 10 at Elizabeth (N. J.) General Hospital after a brief illness. His age was 54. A native of Elizabeth, Mr. Connors served overseas during the first World War with the 312th Engineers of the Eighty-Seventh Division. He is survived by his mother, his widow, a daughter and two sons.

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Boston BIMS' Winter Party

The Winter Party of the BIMS of Boston was held at the Weston, Mass., Golf Club, Mar. 3. In addition to dinner, the evening was featured by bowling, cards and other indoor sports. M. E. Nourse of Howe & French, Inc., who was chairman, was elected to the post at the group's executive committee meeting Feb. 4.

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Opens Atlanta Office

The opening of a sales office in Atlanta, Ga., at 44 Broad St., was announced during February by Carbide and Carbon Chemicals Corp., New York. Ray G. Kelso, previously of the company's Philadelphia office and with Carbide and Carbon since 1935, has been appointed district manager.

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Hooker Advances Klaussen

Works manager of the Niagara plants since 1940 and a member of the company's board of directors since 1942, Bjarne Klaussen has been advanced to the position of vice-president in charge of production, Hooker Electrochemical Co., Niagara Falls, N. Y., announced last month. Mr. Klaussen is a graduate of the University of Oslo, and has been a member of the Hooker organization since 1916.

Firmenich in New Quarters

Firmenich & Co., manufacturers of aromatic chemicals, are now located in new quarters at 250 W. 18th

St., New York. Company offices, plant and laboratory are located in the recently built, five-story building that features sound-proofed offices, cold cathode and fluorescent lighting and rubber tile flooring. The 5,000 square feet of the top floor house the administrative offices, which are partitioned largely by corrugation and plate glass and glass brick sections. Laboratories for mixing and testing are located on the fourth floor and in the basement.

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P. & G. Overseas Div.

A new overseas division with W. L. Lingle, Jr., as manager, was announced recently by Procter & Gamble Co., Cincinnati. Other appointments in the new division include those of Harold H. Staff as director of marketing and Morton P. Woodward, who will be in charge of manufacture. The new overseas division will be responsible for all phases of the operation of the P. & G. foreign subsidiaries and the marketing operations of Procter & Gamble Trading Co., and the Hawaiian and Alaskan operations of Procter & Gamble Distributing Co.

At the same time it was announced that J. H. Taylor had been appointed director of industrial relations and D. F. Howe as director of industrial engineering. Mr. Taylor assumes responsibility for health, safety, employee service, employment, training, personnel research and labor relations. Mr. Howe will be in charge of the company's research and development work covering methods and equipment and will administer time and motion studies and wage incentive plans.

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P. & G. Expanding on Coast

Building permits were recently issued to Procter & Gamble Manufacturing Co., for construction of two factory buildings at 1601 W. Seventh St., Long Beach, Calif. The concrete structures, to be two stories in height, will cost $159,283.

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Lueders Co. Veteran News

Robert Emmett Desmond, manager of the San Francisco branch of George Lueders & Co., New York, has retired, effective Mar. 1, after having been with the company for 35 years. He will be succeeded by Paul L. Cooley, who has been with the firm for 17 years, the past several having been spent on the Pacific Coast. Mr. Desmond, before joining the Lueders company in 1913, was an officer and director of Sanitol Co., St. Louis. He has spent his entire career with the company on the Pacific Coast, and has been general manager there since 1930, when he was chosen to succeed the late Felix Joendorf.

Another member of the Lueders organization, John Kreppel, assistant manager of the company's Brooklyn factory, became the 40th member of the "Veterans' Organization" on Feb. 10 at a luncheon held in honor of the occasion.

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Coast Oil Plant Expands

A building permit was issued last month for the construction of a new warehouse building at 410 S. Avalon Blvd., San Pedro, Calif., for Vegetable Oil Products Co. The concrete block structure, to be 60 x 80 feet in area, will cost $55,000.

Await 2nd Quarter Fat Export Allocations

FAT and oil export allocation quotas for the second quarter were being readied for announcement early this month, and were expected to be made public about March 10th following a meeting in Washington March 1 at which industry representatives were consulted as to the accuracy of department estimates by George Prichard, head of the Fats and Oils Division of the U. S. Department of Agriculture. Mr. Prichard indicated that all surplus stocks of fats and oils would continue to be exported. It was suggested by industry representatives that every effort be made to cushion the market impact of allocation announcements by making them as promptly as possible, and by avoiding sharp swings in the size of the allocations from quarter to quarter, if possible. Mr. Prichard indicated a willingness to go as far along in this direction as possible, but pointed out that the size of each quarterly allocation could be expected to vary within rather wide limits, based on changes in production and consumption estimates.

A number of the production estimates totals, agreed upon at the previous meeting, December 11, were raised at the March 1 meeting, on the basis of latest field reports. Soybean oil production for the first nine months of the current crop year will be 30,000,000 pounds higher than anticipated earlier, because yield figures are currently running 9.2 lbs. per bushel instead of the 9 lb. figure used in the earlier estimate. Former production estimates on cotton oil and lard were also revised upward. The heavier weight of pigs being shipped will probably boost lard production in the Jan.-Mar. quarter to 700,000,000 lbs.

Figures on tallow and grease production for recent and the current quarters were also revised rather sharply upward. The previous estimate for the Oct.-Dec. 1947 quarter had been 440,000,000 lbs., but actual production was 530,400,000 lbs. The estimated production for the Jan.-Mar. quarter has been upped from 445,000,000 lbs. to 480,000,000 lbs. Because of current lower lard prices, more meat scrap is going into tallow rather than into lard.

As for the outlook on coconut oil, it was reported that copra arrivals can be expected to drop, at least as much as 10 per cent, starting in April, because of the serious damage from the recent hurricane, particularly in southern Luzon. It was also reported that west coast crushers face a rationing of electrical power which could reduce their operations as much as 30 per cent.

Andrew Federline, representing the Soap and Detergent Manufacturers Association, asked why, in view of the threatened shortage of coconut oil, the department authorized any exports of coconut oil from the U. S. It was explained that these exports are for the most part merely "trades." An American copra crusher will agree to supply oil to a foreign buyer, and in return will have his own quota of copra increased. Thus there is in effect no net loss of coconut oil supplies to the U. S., but merely a gain in American crushing activities.

A statement was read into the record by Frank Wise of the National Renderers Association commenting critically upon use of edible products in soap making in the face of the current world wide food shortage. (See Page 63.

Rosin Output Down in '47

Total U. S. production and consumption of wood and gum rosin declined, while exports were up sharply in the nine month period from Apr. 1 to Dec. 31, 1947, as compared with the comparable period of 1946, according to figures contained in the third quarter, 1947-48 Naval Stores Report, which was issued Feb. 11. The report, which is prepared by the Bureau of Agricultural Economics of the U. S. Department of Agriculture, Washington, D. C., shows that production of wood, gum and reclaimed rosin dropped to 1,608,111 drums (520 pounds net) for the period Apr. 1 to Dec. 31, 1947, from 1,368,373 drums during the similar period in 1946.

Rosin consumption totaled 1,025,967 drums for the nine months ending Dec. 31, 1947, a slight decline from the 1,036,551 drums produced in the same period in 1946. Stocks of rosin (both wood and gum) on Dec. 31, 1947 totaled 339,269 drums, compared with 398,102 drums a year earlier.

Martin Schultes Better

Martin Schultes, vice-president of the Hewitt Soap Co., Dayton, O., was released from the Doctors' Hospital, New York, late in February after a four-week stay for observation and an enforced rest. He left New York February 29th for a month at Natchez, Miss. to further his recuperation. During his absence, the New York sales headquarters of Hewitt Soap will be in charge of Leonard Schultes, his son. Martin Schultes, founder and first chairman of the BIMS of New York recently retired as head of that organization and was succeeded by Peter Forsman of the C. H. Forsman Co.

FTC Rendering Hearing

A meeting of representatives of the rendering and related industries and the Federal Trade Commission was held in Washington, D. C., Feb. 20 to discuss proposed trade practice rules for the rendering industry. Three of the rules tentatively drafted by the F. T. C. of interest to the soap industry cover false or misleading advertising, etc., claims; interfering with competitors' rights to sell finished products to anyone he chooses and fixing of prices.

Williams' Daughter Dies

Miss Anne S. Williams, 71, daughter of the late James B. Williams, founder of J. B. Williams Co., Glastonbury, Conn., died suddenly Mar. 15 at a Bradenton, Conn., hotel. She is survived by a brother, Samuel H. Williams of Glastonbury.

Renderers Seek Increase In Fat Exports

THE following statement outlining the position of the National Renderers Association on export allocations for fats and oils was presented by Frank B. Wise, secretary-treasurer of the association, at the industry conference held in Washington, March 1, under the sponsorship of the Fats and Oils Branch, Production and Marketing Administration, U. S. Department of Agriculture. (See page 61 for an account of this meeting.)

As producers of inedible tallow and grease, the members of the National Renderers Association are intensely interested in the overall fats and oils situation, both domestic and international, and are especially concerned with developments in the animal fat field.

The interchangeability, within certain limits, of all fats and oils is now a widely recognized actuality but unfortunately the competitive relationship between edible (lard and rendered pork fat) and inedible (tallow and grease) animal fats is not so well understood—except to those who experience it. Here is how it operates: whenever edible animal fats reach a substantial supply position and price-wise begin to get down near inedible animal fat levels, buyers of inedible fats invariably quote the edible picture; this of course imparts weakness to the whole inedible animal fat market. Many of our members have encountered this situation repeatedly in recent years and no doubt some are feeling the effects of it at this very moment.

We have repeatedly called attention to this condition and the record of the last two conferences, similar to today's will show that the spokesman for this organization on each occasion made reference to this particular situation. It may be, however, that our problem has received at least some recognition in Washington for we understand a Department of Agriculture official recently told a gathering of soap makers that the government was closely watching the quantity of edible fats currently being used in soap production and would be prepared to take appropriate action regarding this, if necessary. We emphatically support such a policy and urge that renewed attention be given it, believing that current world shortages of food demand the most nutritious use possible of each and every American edible product. The members of this Association have contributed substantial time and expense in the government endorsed efforts to reclaim waste fat and oil bearing materials, as exemplified particularly in the Household Grease Salvage Campaign, but some members of the industry are wondering as to the need for continuing this so long as quantities of edible fats are being used, for example, in the soap kettle.

Foreign countries have historically purchased large quantities of edible animal fats from the United States and we believe such a preference and demand still exists although of course many nations are now experiencing considerable difficulty in obtaining the necessary purchasing power. In closing, may we at the expense of repetition leave with you this request and observation: that the government do everything possible in the way of export allocations to assure that edible fats do not become a burden on the domestic market thereby creating noticeable weakness in the inedible tallow and grease markets. At the same time, however, we insist that inedible animal oils and fats export allocations receive adequate consideration in their own right. Specifically, we desire to record the following recommendations:

1. That lard export allocations for the second quarter of 1948 be liberalized to the extent possible compared to first quarter 1948 export allocations of the same.
2. That the government continue its announced policy of checking the quantities of edible animal fats used for inedible purposes and take appropriate action with reference to this practice, wherever it may become necessary.
3. That inedible animal fats and oils export allocations for the second quarter of 1948 be liberalized to the extent possible compared to first quarter 1948 export allocations of same.

Correction

In reporting the election of W. H. Sheffield, Jr., of Innis, Speiden & Co., New York, to the board of directors of the Chlorine Institute in our February issue, we erroneously stated that he served as president of the Institute from the first meeting of the board in 1924 until 1934. Actually it was Eben C. Speiden, vice-president and works manager of Isco Chemical Division of Innis, Speiden Co., who had served as president during the 10-year period. We regret the inadvertence and are sorry for any embarrassment it may have caused either or both men.

Lautier Fils Relocate

Lautier Fils, Inc., are now relocated in their own building at 321 Fifth Ave., New York 16. Both offices and laboratories are situated at the new address.

Huge G. H. Wood Display

A mammoth display, 36 feet wide and 30 feet deep, was exhibited by G. H. Wood & Co., Toronto, at the recent Canadian National Exhibition, which was attended by over three million people. The Wood display, situated in the General Exhibits Building, was a three tier affair topped off by a revolving globe. Beneath the globe were panels on four sides of a rectangular area, one showing an illustration of the Wood outdoor sign board. Another featured a young woman performing a cleaning operation. Behind the counter several young women demonstrated company products. The whole display weighed over six tons.

Edw. Wrigley Dies at 77

Edward Wrigley, 77, who retired in 1935 as president of Wrigley Mfg. Co., Philadelphia soap firm, died Mar. 4 at his home in Ocean City, N. J. He was a brother of William Wrigley, Jr., founder of the chewing gum company, whose father founded the soap company.

Harry Drackett Dies

Harry R. Drackett, 60, president of the Cincinnati chemical firm bearing his name, died Mar. 5 at Holmes Hospital, Cincinnati. A graduate of Ohio State, he began his career with Procter & Gamble Co. After working for several Canadian concerns, he later returned to join his father in the Drackett company, becoming president in 1932.

NEW TRADE MARKS

The following trade-marks were published in the February issues of the *Official Gazette* of the United States Patent Office in compliance with Section 6 of the Act of September 20, 1905, as amended March 2, 1907. Notice of opposition must be filed within thirty days of publication. As provided by Section 14, fee of ten dollars must accompany each notice of opposition.

Trade Mark Applications

Blue Isle—This in upper case, medium bold letters for toilet and bath soap. Filed Mar. 26, 1946 by Jaquet, Inc., New York. Claims use since Feb. 27, 1946.

Baby Rose—This in upper and lower case, extra bold letters for soap. Filed Feb. 10, 1947 by Armstrong Grocery Co., Sharon, Pa. Claims use since 1946.

Mido—This in extra bold, oversize, lower case, letters for chemical floor cleaning compounds. Filed Mar. 24, 1947 by Mido Products, Torrance, Calif. Claims use since June 1, 1946.

Kew Bee Kut—This in upper case letters, each word along one side of one of three cubes for granular mineral material for absorbing oils, grease and water from floors. Filed July 1, 1947 by National Sawdust Co., Brooklyn. Claims use since Jan. 25, 1945.

Antara 424—This in upper case, bold letters and numerals for a wetting agent. Filed Aug. 24, 1946 by General Aniline & Film Corp., New York. Claims use since July 18, 1946.

Glycox—This in upper case, bold letters for emulsifying agent and wetting agent. Filed Oct. 11, 1946 by Glyco Products Co., Brooklyn. Claims use since Apr. 10, 1946.

Plee-Zing—This in upper case, extra bold, black letters for ant killing preparation. Filed Oct. 11, 1946 by Plee-Zing, Inc., Chicago. Claims use since June 9, 1943.

RC Products — This in upper case, open letters on a lined rectangular background for chemical preparations for the removal of soot. Filed Nov. 21, 1946 by Ridgefield Chemical Products Co., Ridgefield, N. J. Claims use since June 27, 1945.

Dekapine—This in upper case, bold letters for disinfectant. Filed July 1, 1947 by West Disinfecting Co., Long Island City, N. Y. Claims use since May 27, 1947.

Pot "Luck"—This in upper and lower case, extra bold, oversize script and upper case, smaller, bold letters for metallic sponge for cleaning metal surfaces. Filed Nov. 23, 1946 by Ross Coles & Co., Chicago. Claims use since Nov. 1, 1945.

Dentalets—This in upper and lower case, extra bold letters for tooth powder in tablet form. Filed Jan. 17, 1947 by Supreme Pharmacal Co., Allegan, Mich. Claims use since June 21, 1946.

Launder Moth—This in upper and lower case, script and upper case, block letters within a reverse outline of a moth for mothproofing composition. Filed Apr. 18, 1947 by Launder Moth, Inc., Hyde Park, N. Y. Claims use since Apr. 2, 1947.

Powco—This in lower case, bold letters across an oblaid spheroid line through which runs an irregular line for insecticides, germicides, disinfectants, etc. Filed May 26, 1947 by John Powell & Co., New York. Claims use since Oct. 4, 1946.

Sherwin-Williams—This in large and small capital letters for paste and liquid waxes and polishes for various surfaces. Filed Apr. 30, 1947 by Sherwin-Williams Co., Cleveland. Claims use since 1878.

Speed King — This in upper case, extra bold, black letters for insecticide sprayer. Filed May 9, 1947 by Edco Corp., Brooklyn. Claims use since Jan. 6, 1947.

Sparky—This in upper case, extra bold, black letters for liquid window cleaner. Filed Aug. 30, 1946 by Nash & Kinsella Labs., St. Louis. Claims use since June 5, 1946.

Ty-Clean — This in upper and lower case, extra bold letters one syllable above the other for typewriter cleaning fluids. Filed Oct. 16, 1946 by Winn Products Corp., Newport News, Va. Claims use since June 28, 1946.

Win-Glo — This in upper and lower case, open and shadow letters for window cleaner and applicators for use with same. Filed Oct. 17, 1946 by Nash & Kinsella Labs., St. Louis. Claims use since Oct. 3, 1946.

All—This in lower case, extra bold, oversize letters for detergents for use as a laundry powder. Filed Oct. 31, 1946 by Detergents, Inc., Columbus, O. Claims use since Sept. 29, 1946.

Rad—This in upper case, bold letters for rat poison. Filed Oct. 16, 1946 by Bielefeld Products Co., New Knoxville, O. Claims use since Oct. 5, 1946.

CB—This in upper case, extra bold, oversize initials for chemical fire extinguishing compound for use in fire extinguishers. Filed Jan. 9, 1947 by Michigan Chemical Co., St. Louis, Mich. Claims use since Nov. 29, 1946.

Writes on Fatty Acids

Writing in the recently issued winter number of *Progress Thru Research*, house magazine of General Mills, Inc., Minneapolis, Dr. Ralph H. Manley, director of research, discusses fatty acids from both the historical and the technological viewpoints. Modern techniques and new methods of producing fatty acids are discussed by Dr. Manley, whose company is now building a large new organic chemicals plant at Kankakee, Ill., where fatty acids will be produced.

New Election for CSA

The resignation of the president, J. Robert Fisher, Fisher Chemical Co., New York, and five other directors of the Salesmen's Association of the American Chemical Industry, New York, took place at a meeting of the board, Feb. 17, according to a recent letter from the Association to its members. The resignations were submitted because the president and directors "felt that the recent election indicated a virtually even split vote." As a result, a new nominating committee has been named, and another formal election is to be held.

Joins Gerard Danco

Thomas M. Biallo has joined the sales staff of Gerard Danco, Inc., New York essential oil dealers and importers, and will call on the trade in the Metropolitan New York area, the company announced last month. Mr. Biallo, who is a native of Belgium, was an officer fighter pilot in the Britain Royal Air Force from 1942-45.

Issues Machinery Listing

Chemical & Process Machinery Corp., new and used machinery firm, New York, announced Feb. 25 the issuance of two new Spring listings of chemical and food machinery. Copies are available on request.

BIDS AND AWARDS

Huggins Disinfectant Award

James Huggins & Son, Malden, Mass., with a low bid of 72 cents, received the award on 420 gallons of disinfectants, in a recent opening for miscellaneous supplies by the Treasury Department, Bureau of Federal Supply, Washington, D. C. Other bidders in the same opening were: Boston Chemical Industries, Washington, D. C., $1.42; Harley Soap Co., Philadelphia, $1.15; R. M. Hollingshead Corp., Camden, N. J., 86 cents.

P. O. Liquid Soap Bids

The following bids were received in a recent opening for miscellaneous supplies by the Post Office Department, Washington, D. C., on 150 gallons of liquid toilet soap: James Good Co., Philadelphia, 60 cents a gallon; U. S. Sanitary Specialties Corp., Chicago, 69 cents; Trio Chemical Works, Brooklyn, 61 cents and 68 cents, f.o.b. Washington; Idico Products Co., New York, 82 cents; Clifton Chemical Co., New York, 74 cents; Dixie Janitor Supply Co., Washington, D. C., $1; Rose Chemical Co., New York, 62 cents; Lanair Chemical Corp., Chicago, 54 cents and f.o.b. Washington, 67 cents Crystal Soap & Chemical Co., Philadelphia, 65 cents; Chemical Manufacturing & Distributing Co., Easton, Pa., 50 cents; Fischer Industries, Cincinnati, 61 cents, f.o.b. Washington, 67 cents; Ampion Corp., Long Island City, N. Y., 67 cents; Harley Soap Co., Philadelphia, 46 cents, f.o.b. Washington, 52 cents; Davies-Young Soap Co., Dayton, O., 78 cents; Bri-Test, Inc., New York, 58 cents, f.o.b. Washington.

Treas. Awards to Harley

Harley Soap Co., Philadelphia, submitted low bids on 825 gallons of liquid soap (51S-1715) and 330 gallons of disinfectant (51D-394-100) in a recent opening for miscellaneous supplies by the Treasury Department, Bureau of Federal Supplies, Washington, D. C. The award to Harley was based on a bid of 60 cents on the liquid soap and 90 cents on the disinfectant.

Cleaning Compound Award

An award on 275,000 pounds of cleaning compounds was made to Axton-Cross Co., Chesire, Conn., in a recent opening for miscellaneous supplies by Raritan Arsenal, Raritan, N. J. The Axton-Cross bid was 5.92 cents a pound.

Sweeping Compound Bids

In a recent opening for miscellaneous supplies by the Bureau of Federal Supply, Treasury Department, Washington, D. C., the following bids were received on 2,000 pounds of sweeping compound: Worth Spar Co., Middletown, Conn., 3.6 cents and alternate of 3 cents in standard 50-pound, lined burlap bags; Mollen Chemical Co., Philadelphia, 4 cents; Allen Burns Co., Buffalo, 3.5 cents; Mathers-Lamm Paper Co., Washington, D. C., 3.5 cents; Lasting Products Co., Baltimore, 5.2 cents; Puritan Chemical Co., Atlanta, Ga., 4.5 cents; Dustbane Products Co., Chicago, 3.88 cents; Janitors Supply House, Baltimore, $3.90 cwt; Daycon Products Co., Washington, D. C., 3.83 cents, total of $76.60; A. M. R. Chemical Co., Brooklyn, 3.4 cents; Paxson Manufacturing Co., Philadelphia, 3 cents.

Soap Powder Bids, Awards

Spazier Soap & Chemical Co., Santa Monica, Calif., and Gillam Soap Works, Fort Worth, Tex., received the awards on an unspecified quantity of laundry soap powder with bids of 27 cents a pound and 24.6 cents a pound, respectively, in a recent opening for miscellaneous supplies by the Army Quartermaster Corps for Utah and Colorado. Other bidders in the same opening were Bell Packing Co., Detroit, 29.5 cents a pound; Conroy Products Co., New York, 25.55 cents a pound for Colorado and 36.5 cents a pound for Utah; Wm. Messer Corp., New York, 45 cents a pound, Colorado, and 42.5 cents a pound for Utah; Kamen Soap Products Co., New York, 36 cents a pound for Colorado and 37 cents a pound for Utah; Chicago Sanitary Products Co., Chicago, 30.375 cents a pound, Colorado, and 31.075 cents, Utah.

Justice Dept. Soap Bids

Bids on the following items of soap were received in a recent opening for miscellaneous supplies by the Department of Justice, Terre Haute, Ind.: item 1, 5,000 pounds of chip soap; item 2, 3,000 bars of laundry soap; item 3, 400 cakes of grit soap and item 4, 3,600 cakes of toilet soap.

Bidders were: Armour & Co., Chicago, item 2, 13.5 cents; Cudahy Packing Co., Chicago, item 2, 20.5 cents; Iowa Soap Co., Burlingame, Ia., item 3, 6.85 cents; Levin Brothers, Terre Haute, Ind., item 1, 24.5 cents; item 2, 17 cents; item 3, 7.75 cents, and item 4, 11 cents; Kamen Soap Products Co., New York, item 1, 25.7 cents and item 2, 13.4 cents; C. W. Bauermeister Co., Terre Haute, Ind., item 4, 15.5 cents or 9.2 cents; Swift & Co., Chicago, item 2, 13 cents, item 3, 6.5 cents and item 4, 9.6 cents; M. Werk Co., Cincinnati, item 2, 9.46 cents and item 3, 7.51 cents.

Treas. Shoe Polish Bids

In a recent opening for miscellaneous supplies by the Treasury Department, Bureau of Federal Supply, Washington, D. C., among the bids received on 250 containers of shoe polish (51-P-1170) for East Point, Ga., and 1,380 for Fort Worth, were those of: American Polish Co., Washington, D. C., No. 3 can, 5.84 cents, 1¾ oz., No. 4 can, 9.72 cents, 3⅛ oz., all destinations; Whittemore Bros. Corp., Cambridge, Mass., 8 cents, all destinations; K. J. Quinn & Co., Boston, item A, 12 cents, B, 12.3 cents; Manhattan Kreole Products, Brooklyn, $8 a gross packed in one gross cartons.

RAW MATERIAL MARKETS

As of March 4, 1948

THE sharp drop in prices of fats and oils, caustic soda and some of the other raw materials used by soap makers, following the sudden break in commodity prices at the Chicago grain exchange starting Feb. 4, was the leading market development of the month. Tallow prices, for example fell from a near-record price of 27 cents for the fancy grade, early in February, to 18 cents. Coconut oil prices plunged six cents from about 24 to 18 cents; cottonseed oil dropped to 21 cents; soybean oil, which had been selling for 27½ cents during January fell to 16½ cents by Feb. 6; copra prices by the end of the first week of February were down to $260 a short ton, c.i.f. Pacific Coast.

The price decline was not confined to fats and oils. Caustic soda and soda ash prices were cut five and two and one-half cents a pound, respectively, during the third week of February. Flake caustic, which had previously been selling for upwards of 14 cents a pound, was cut to nine cents. Soda ash prices were reduced from five to two and one-half cents a pound in the mid-February action. The break in caustic prices stems from lack of foreign buying interest, which until recently had been a large factor in the market.

Tallow prices after dropping sharply to 18 cents picked up some strength and rose to 20 cents, later falling back to 18 cents. Having climbed another cent, they were reported as being strong at 20 cents a pound on this date, with none reported being available for under 21 cents. Other oils, such as cottonseed, soybean and coconut showed increases of from one-half to one cent a pound during the closing days of February and the first few days of March.

Another factor affecting the oil market during the past month is the reported entry of the Supreme Command of Allied Powers into the Philippine copra market. SCAP is said to be in the market for from 5,000 to 7,000 long tons of copra, f.o.b. the islands for shipment to U. S. occupied areas. The agency is said to have set a maximum allowable price of $300 a long ton for the copra.

Figures on U. S. imports of fats and oils, released early in March by the U. S. Department of Agriculture, indicated that a 50 per cent increase was recorded in 1947, as compared with 1946. Approximately 1,370,000,000 pounds (in terms of

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a group of powerful perfume oils for soap

For a group of products that are effective in small proportions, have outstanding olfactory strength and persistence, are stable in alkali media, readily available in large quantities, thoroughly consistent from one batch to another—try Givaudan's time-tested and well-honored Citrenes and related products. Pioneers in the field of citronella substitutes, the Givaudan laboratories are particularly well equipped to develop odors having a citronella character.

CITRENE	A woody topnote adds interest to a tenacious odor of a citronella and sassafras type.	**$1.00** per pound
CITRENE No. 2	A variation of Citrene, having somewhat of a balsamic character.	.78
CITRENE X	Rosy and lemony, a tenacious, pleasant scent to cover any obnoxious odors of a scouring powder.	1.00
CITROLENE	Potent, fresh, and clean—a woody, citrus odor having excellent coverage.	.47
CITROSE	A very potent, clean-smelling odor, based on a citronella-citrus composition—excellent for mechanics' hand soaps.	.40

Prices are per pound in 50-lb. quantities

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oil) were brought into the U. S. during 1947, as against 496,169,696 pounds in the previous year. The 1947 figure was around 18 per cent under the 1935-39 average. Copra and coconut oil (in terms of oil) approached 878,000,000 pounds, representing an increase of 76 per cent over the amount that was imported in 1946, and about 37 per cent above pre-war levels. In 1947, 63,212,000 pounds of palm oil were brought into the United States. In 1946, the U. S. had palm oil imports totaling 37,850,000 pounds. Receipts of palm oil are still 80 per cent less than prewar. Inedible olive imports in 1947 amounted to 248,000 pounds, as compared with 103,000 pounds in 1946. Large increases were also reported for such oils as castor, sesame seed, tea seed and tucum kernels.

Although domestic production of fats and oils in the 1947-48 crop year is expected to be around 9,687,000 pounds, which is slightly greater than in 1946-47, animal fat production is expected to be considerably under last year's figures. Hog slaughter in 1948 will run to about 48 million animals, about five million under 1947, and, in addition, the animals are expected to be lighter on the average than in 1947, which means considerably less lard and grease than the decline in the number of hogs slaughtered in 1948 would indicate.

Also announced during the past month was the discontinuance of special provisions governing the licensing of soybean oil for export to countries from which an equivalent amount of olive oil is imported into the United States. The reason given for the step is the fact that olive oil is now under allocation by the International Emergency Food Committee, which will establish import quotas for the United States and other IEFC participants. Since the exchange of soybean oil for imported olive oil would be contrary to this agreement, according to the Office of International Trade, it was necessary to discontinue the exchanging procedure.

A prediction that prices of Brazilian carnauba wax would decline this year in spite of efforts by the Brazilian government to place controls at the source was made during the month by the head of a floor wax and polish company. The reason for the drop in prices, anticipated by the manufacturer, is the fact that 10 per cent of last year's crop of carnauba wax is still in warehouses in Brazil. In addition, a larger crop than usual is expected because a dry season is due in Brazil this year. The dry seasons come about every nine years. In dry seasons the amount of wax accumulating on the carnauba palm is heavier than usual. Another favorable factor concerns young palms many of which have now reached legal maturity standards. Originally, the price of the carnauba was increased by a decree of the Brazilian government which forbade the cutting of leaves from young trees.

Perfuming material prices on the whole are firmer than they have been in some time. The recent drop in the commodities market has failed perceptibly to affect prices of perfuming materials. In general such oils as lemongrass, citronella and spike lavender are firmer, whereas bergamot and lavender are off somewhat.

"You can't miss with Hardesty"

"... because Hardesty *won't* miss with you. Dependable — that's a word that gets kicked around a lot these days — but it really fits Hardesty. When they say they'll have a shipment in your plant on a certain day, it's there!

Hardesty is dependable in another sense, too. Their products are always uniform. There's not any last-minute juggling of formulas because of a change in a fatty acid, — not if it's a *Hardesty* fatty acid. No customer kick-backs, either, because soaps, plastics and textiles manufactured and processed with Hardesty products are of identical quality.

The Hardesty Way is the Easy Way. Don't miss Hardesty . . . because you *can't* miss *with* Hardesty.

Red Oil **Glycerine** **Stearic Acid** **White Oleine**
Stearine Pitch **Hydrogenated Fatty Acids** **Animal and Vegetable**
Distilled Fatty Acids.

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W·C· HARDESTY COMPANY

Sidelines for the Soaper

Dependable sideline items offer a flexibility of production to meet demands of a fast-changing market

SOME firms like to have a line of household cleansers of various types in order to tap a broader market and insure themselves against the possibility of the sudden loss of business that often faces a "one-product" company. It is well to have a few formulas on hand which have been worked out and tested on a small laboratory scale to the point at which plant scale production can be started on a sound basis. The formulas described below for modern household preparations have been worked out and tested in practical experiments and should enable a manufacturer to produce a satisfactory product.

Universal Cleaners

CLEANERS described as universal are recommended for cleaning tiles, for washing dishes, clothes, upholstery, floors, etc. This kind of cleaner, well known in Britain, contains only 12.5 per cent of total dry solids; 6.5 per cent is fatty alcohol sulfate, about 4 per cent sodium sulfate, and 2 per cent soda ash. The range of dilution for use with water is between 1:4 and 1:20. The lower dilution is used as a kind of spot cleaner on carpets or plush. The higher dilution is for dish washing. A suitable formula for a good product would be:

	%
Commercial fatty alcohol sulfate	20
Tetrasodium pyrophosphate	2
Pine oil	0.02-0.05
De-ionized water	to 100

This corresponds to 10 per cent of active detergent ingredient, about 50 per cent sodium sulfate being present in the commercial product.

Glass Cleaners

MODERN glass and window cleaners are built up on the basis of water-miscible solvents containing small percentages of detergents. The presence of 0.5-1 per cent of synthetic detergent, with or without addition of alkali, enhances the polishing effect of isopropyl alcohol. A formula follows:

	%
Isopropyl alcohol	90
Ethyl acetate	4
Ammonia, 10%	5
Synthetic detergent	1

This solution is allowed to stand for some days in a cool place before filtering.

Abrasive Hand Cleaners

A PASTE hand soap may be made as follows:

	Parts
Transparent soft soap	130
Bentonite	150
Fine sand	200
Soda ash	10

The solid materials are incorporated into the soft soap. Water may be added to regulate the consistency. A powdered cleaner may be made from:

	Parts
Powdered soap	26
Abrasive	70
Borax or soda ash	4

Some of the abrasive material may be replaced by sawdust.

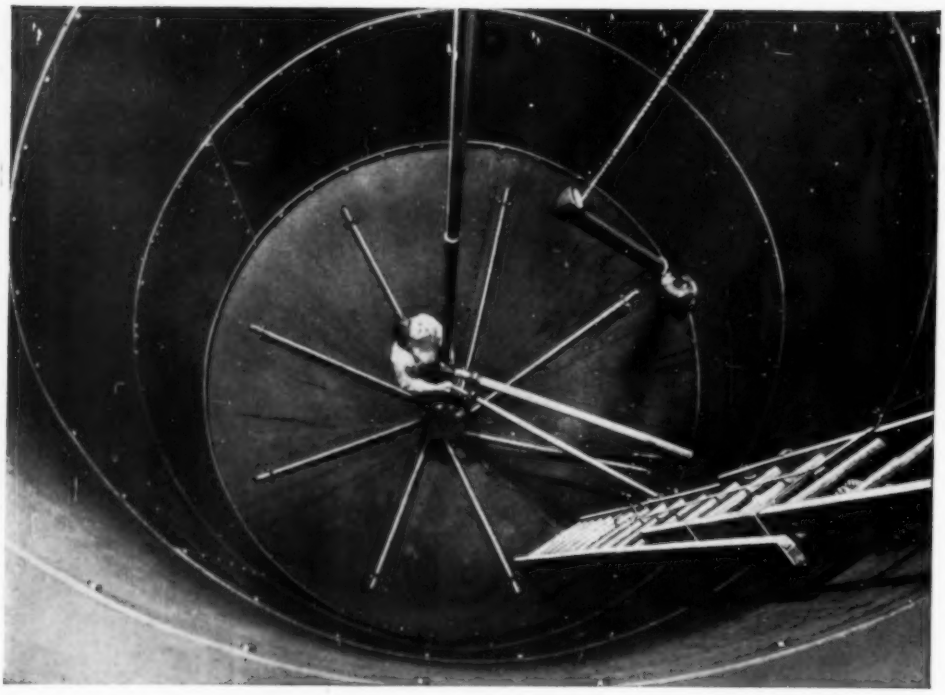
A special hand cleaning compound containing about 75 per cent of borax and 25 per cent of dry soap possesses desirable fungicidal properties and yet is mild in action on the skin. The borax is in finely granulated form. Its hardness of 2 makes it softer than chalk; it is readily soluble; and its abrasive action is only temporary, as the sharp edges of the grains become blunted almost instantly.

Abrasive soap in cake form is produced by simply incorporating the abrasive into the hot soap in the crutcher. Coconut or palm kernel oil soaps are most suitable for this use. The soap is adjusted to a fatty acid content of 50-60 per cent before the abrasives are added and stirred in. The mass is then run off into frames, and cut after it has solidified. Representative formulas are as follows:

	Parts
Soap base	75
Sodium silicate, 40° Be.	5
Pumice	10
Fine sand	10

	Parts
Bentonite	5
Silica	5
Pumice	10
Soap base	75
Sodium silicate	5

Some of the mineral abrasives may be replaced by sawdust or other soft material. It is sometimes advisable to mix ultramarine with the abrasives to



Nickel-Clad Steel was used by Toronto (Ontario) Iron Works, Ltd., for this soap boiling kettle, built for a prominent Canadian manufacturer of fine soaps.

● *SOAP KETTLE OF*

LUKENS NICKEL-CLAD STEEL

prevents harmful contamination

Lukens Nickel-Clad Steel provides here, at lower cost, all the advantages of solid nickel—a surface of nickel which is highly resistant to the attack of caustic soda, salt and fatty acids, thus preventing contamination of fine soaps. There is no harmful action affecting odors or colors.

Soap manufacturers use Lukens Clad Steels—Nickel-Clad, Stainless-Clad, Inconel-Clad and Monel-Clad—in such applications as evaporators, crutchers, filters, hoppers, amalgamators, pressure tanks, plodders, mixers, storage tanks and the like.

In glycerin production, evaporator bodies, salt catchers, filters, and bleaching tanks of clad steel give excellent service.

Each Lukens Clad Steel is a precision product, controlled from assembly to finish, consisting of a layer of solid nickel, stainless, Inconel or Monel, permanently bonded to a steel backing plate. Standard claddings of 10% or 20% of the total plate thickness suit most applications, but other percentages are available by special arrangement.

Lukens Clad Steels represent the most complete range available to industry. For additional information write for Bulletins 338 and 255, Lukens Steel Company, 446 Lukens Building, Coatesville, Penna.

CLAD METAL STEEL

LUKENS

Nickel-Clad Stainless-Clad
Inconel-Clad Monel-Clad
STEELS

SOLID METAL ADVANTAGES WITH CLAD STEEL ECONOMY

eliminate the gray tint, using 0.5-0.75 per cent. Addition of 2-5 per cent of pine oil may enhance the cleaning effect, especially in removing fatty materials.

Lavatory Bowl Cleaners

THESE products are based on sodium bisulfate or other acid salt. Caking can be overcome by adding 0.5-1 per cent of pine oil or a mixture of pine oil with kerosene. This also prevents to a large extent corrosion of the metal containers. The cleaning effect can be improved by adding 1 per cent of synthetic detergent such as alkyl aryl sulfonate.

Household Disinfectants

BRITISH household disinfectants of chlorinated phenol or benzyl cresol, enhanced by the odor addition of terpineol and benzyl acetate, are highly successful. They combine germicidal effectiveness, a pleasing appearance, nonstaining character, and refreshing odor. S. Alperin, *Soap, Perfumery, Cosmetics 20,* 1190-94 (1947).

Enzyme Cleaner Tested

The cleaning action of soaking agents based on enzymes, on artificially soiled cotton strips was tested by laboratory methods. A mixture of blood albumin, water-soluble starch, whole milk of a definite fat content, and lampblack, proved most satisfactory for demonstrating the differences in the cleansing action of the various preparations used, since it responded equally well to both alkali and enzymes.

The differences in the action of the preparations were not so marked in practical soaking and washing tests as in the laboratory tests. No appreciable difference was noted between the action of the enzyme preparations and bleaching soda on normally soiled domestic laundry. On heavily soiled laundry the enzymic preparations showed a somewhat better cleaning effect when the material being washed contained large amounts of fat- and protein-containing soil. O. Viertel, *Fette und Seifen 51,* 145-8; through *Chem. Abs.*

Detergent Structure

X-ray diffraction studies show that not all aqueous systems of nonionic detergents or surface-active materials give a lamellar structure, for example, "Triton X-100"; and not all aqueous systems give the same type of lamellar structure. Some, such as "Emulphor O" and some concentrations of the system "Triton X-100"-water-benzene, are isotropic solutions which probably contain lamellar micelles similar to those found in solutions of ionic detergents. Some, such as digylcol monolaurate, glyceryl monolaurate, and polyethylene glycol 400 monolaurate, give liquid-crystalline systems which consist of regular alternating layers of detergent molecules and water molecules; some of these systems also contain layers of hydrophobic material. Whether or not the aqueous systems of one of these detergents will have a lamellar structure and what sort of lamellar structure depends on the type of hydrophilic group and the length of this group relative to the length of the hydrocarbon chain. The presence of a hydrocarbon or other hydrophobic material in the system has a strong influence toward the formation of a lamellar structure of either type.

It has been shown that some of the water in these lamellar structures is between the detergent chains, besides that existing in the lamellar layers or between the micelles. It is probable that this water goes between the chains by hydrogen bonding to the ether oxygen atoms prior to the formation of the lamellar layers. S. S. Marsden, Jr., and J. W. McBain, *J. Phys. & Colloid Chem., 52,* 110-30 (1948).

Mixed Solvents for Soaps

Any mixture consisting of two solvents, one the glycolic type such as ethylene glycol, propylene glycol, diethylene glycol, glycerol, and phenol, —and the other any organic solvent which can dissolve hydrocarbons such as higher alcohols and chlorinated hydrocarbons,—has better solvent power for soaps than any of the pure solvents alone. Extensive study of the solvent properties of various such mixtures was made.

The glycol forms hydrogen bonds with the $-COO^-$ end of the soap, and the alkyl group of the soap is dissolved by the hydrocarbon solvent. Thus the mixture is more effective than the individual solvents. The cause of the hydrogen-bonding power of glycol in comparison with alcohols is ascribed to the effect of the interaction of one electro-negative group on another, making the hydroxylic hydrogen atom of glycols more positive than it would otherwise be. The long known soap-dissolving power of phenols, cresols, methyl alcohol, etc., is also explained from this point of view.

It has also been shown that inorganic salts having the group XOO^-, where X is any nonmetallic element, such as nitrites, hypophosphites, metaborates, chlorites, etc. have very high solubility in glycols owing to this glycolic interaction. S. R. Palit, *J. Am. Chem. Soc. 69,* 3120-9 (1947).

Emulsifiers in Cosmetics

The task of choosing the proper surface-active agent to use in formulating cosmetic products is often a difficult problem. No one product excels for all uses. Dermatological properties are of primary importance in items that remain in contact with the skin. The nonionics appear to be most promising for such applications. H. C. Speel, *Am. Perfumer 51,* No. 1, 42 (1948).

Laundering Method

Soil is removed from fabrics by placing them in a quantity of water insufficient to cover them, and agitating while adding soap solution at a fixed rate faster than the rate at which the soap can be neutralized by the soil. The rate is slow enough to permit stopping the soap addition when a blanket of suds of fixed height is first formed on the water. Agitation is continued for a fixed time and the water dumped. The process is repeated on the same fabrics until the blanket of suds formed on the last water at the end of the washing period has risen to a predetermined level. The clothes are then rinsed. G. P. Hebard and H. E. Sheets, to Am. Machine & Metals, Canadian Patent No. 445,711.

COMPOUNDERS!!!

Investigate

Cowles DRYMET*

DRYMET is commercial anhydrous sodium metasilicate. DRYMET contains no water—combined or uncombined. It is the most highly concentrated form of metasilicate on the market.

DRYMET yields more chemical value per pound than other detergent silicates—and it is priced to yield more chemical value per dollar.

DRYMET is readily soluble in all practical concentrations at all practical temperatures.

DRYMET has a total alkalinity as Na_2O of not less than 50%.

DRYMET yields a pH of 11.55 in a .06% solution. DRYMET will improve the detergent efficiency of practically every alkaline solution.

Write for DRYMET File Folder containing complete technical information and suggested formulations.

***DRYMET** is available for immediate shipment.*

*Reg. U. S. Pat. Off.

The Cowles Detergent Company

HEAVY CHEMICALS DEPARTMENT

7018 EUCLID AVENUE • CLEVELAND 3, OHIO

Composition of German Tall Oil Soaps

TABLE I

	Original Soap	Dried Soap	—Dried Soap— 1st. alc. extract	2nd. alc. extract	German Sample I	Tall Oil Sample II	Northern Tall Oil
Appearance	brown paste	gray powder	light gray powder	light gray powder	soft brown crystals	soft brown crystals	homogeneous brown liquid
Per cent Composition							
Water	38.8	4.1	2.9	3.1	0.6	1.0	0.5
Dry substance..	61.2	95.9	97.1	96.9	99.4	99.0	99.5
Ash	9.6	16.9	16.3	14.0	1.0	1.6	1.3
Unsaponifiable	5.4	6.4	6.8	7.2	10.1	9.7	11.2
Resin acids ..	31.3	45.4	46.7	47.2	58.2	59.0	29.5
Fatty acids	14.9	27.2	27.3	28.5	30.1	28.7	57.5
Calculated to anhydrous, ash-free basis:							
Resin acids.....	60.7	57.5	57.8	56.9	59.4	60.6	30.0
Fatty acids	28.9	34.4	33.8	34.3	30.6	29.5	58.6
Unsaponifiable	10.4	8.1	8.4	8.8	10.0	9.9	11.4

TALL-OIL soaps and tall oil constitute valuable by-products in the alkaline decomposition of wood. Data in the German literature as to the composition of tall-oil soaps and tall oil apply to the northern products. Since the composition of the latter may be somewhat different from the corresponding German products, values for these were obtained for purposes of comparison.

The true soap substance was freed as far as possible from the black liquor. In this condition the material consists of a dark brown mass having the consistency of a soap paste. The material so obtained was decomposed into its general constituents and these were quantitatively determined. The soap was then dried at 100° C. to give a concentrate which was ground to a gray slightly hygroscopic powder. This was similarly decomposed into its constituents, which were determined quantitatively. Alcohol extraction of the dried soap gave a light gray powder which was investigated. A further alcohol extraction was made and gave a light gray powder similar to that previously obtained. This also was studied.

Finally a large quantity of tall-oil soap was split by heating with sulfuric acid. The product was then washed completely free of mineral acid, and gave a brown semisolid product with some tendency toward crystallization. This German tall oil is not liquid at room temperature, in contrast to the northern tall oil. On warming, a more or less thick oily condition results, but the product solidifies to a somewhat crystalline condition on cooling again. Table I summarizes the results of these tests.

The first column in the table shows that the German tall-oil soap corresponds to a composition of 60 per cent resin acids, 30 per cent fatty acids, and 10 per cent unsaponifiable. In northern tall-oil soap the proportion of resin acids to fatty acids is exactly reversed. A similar relationship exists in the soap preparations which were dried and in those extracted with alcohol.

The different proportion of resin acids to fatty acids in northern tall oil accounts for its liquid state at room temperature, namely, 30 per cent resin acids and 60 per cent fatty acids. Characteristics of the two types of tall oil are given in Table II.

TABLE II

Tall Oil	Sp. Gr.	Softening Point °C	Liquefying Point °C	Flash Point °C	Viscosity, Engler	Saponification No.	Ester No.	Acid No.	Iodine No.
German	0.971 at 100° C.	20	39	180	8.6 at 100° C.	145	5	140	160
Northern	1.020 at 20° C.	liquid	liquid	170	25 at 20° C.	150	6	144	170

The specific weight of the German tall oil could not be exactly determined at 20° and 50°C. since the substance is not homogeneous at these temperatures and contains air bubbles. Viscosity was therefore also determined at 100°C., when the product is completely homogeneous. The high flash point of the tall oil is noteworthy. In general the constants of the northern tall oil are similar to those of the German tall oil, especially in view of the liquid condition of the former at room temperature.

Obtaining data on German tall oil for comparison with those for northern tall oil fills a gap heretofore present in the literature on the subject. August Noll, *Seifensieder - Ztg.* 73, 184 (1947).

Color Reading of Oils

Spectrophotometry can be used to give values that are proportional to the Lovibond red colors of oils. The correlation is not exact because Lovibond red values are erroneously low on oils containing green. Spectrophotometric values will need to be obtained on not more than three wave lengths. Further work is being done on a system that will work for all vegetable oils. At present, official trading values have to be determined with Lovibond glasses. *J. Am. Oil Chemists' Soc. 24,* 387-8 (1947).

Stops Caustic Etching

Tabulated data show that addition of approximately 5 per cent by weight of a soluble chloride of strontium, barium, bismuth, antimony, or tin to caustic soda solution inhibits the tendency of 3 per cent solutions of caustic to attack the surface of milk or beverage bottles. W. F. Wegst, L. R. Bacon, T. H. Vaughn, and D. J. Crawford, to Wyandotte Chemicals Corp. U. S. Patent No. 2,425,907.

PRODUCTION *Clinic*

By E. G. THOMSSEN, Ph.D.

IN continuing our discussion of dust control let us go on to considerations of methods and equipment, particularly the machinery of certain of the leading manufacturers. This does not necessarily mean their arrangements are the only ones, nor the best ones for the purpose. They do, however, aptly illustrate how dust may be efficiently eliminated.

In processing operations, the methods most widely used are dust filters, centrifugals and electrostatic precipitators. Of these, the first is by far the most general. The dust filters may be simple, using exhaust air (suction) or air pressure. The latter often results from grinding operations.

An example of the most simple exhaust system of dust control is the vacuum cleaner. The dust is permitted to settle in a room or dust chamber and is then picked up from time to time with this device. It may either be self-contained and portable like the ones used in the home, or consist of a central vacuum system piped to various locations to which the cleaning nozzles can be readily attached. Apparatus of this type is a specialty of the Lamson Corporation, Syracuse, N. Y. They market many types of what they term "Exidust Systems" for use in industrial plants. The disadvantage of this type of dust control is that it removes dust that has already settled from the operation and not the dust as it is produced.

A more efficient method of collecting dust is to catch it as it is produced. Dust collectors of this type are varied and proper installations assure close to 100 per cent efficiency. Unit collectors or central collectors are available depending upon the particular problem. In capacity, this type is made in capacities of a few pounds per hour up to tons per hour. The collected dust may be saved, discarded or wet down to a slime, depending upon the user's choice.

A description of some of these collectors will illustrate more fully the advantages of this type. The Breuer Electric Mfg. Co., Chicago, Ill., offers a line of "Tornado Dust Collectors" which are moderately priced for smaller manufacturers. These collectors will collect any type of dust or lint. The filter surface area is large and tubular in construction and completely housed. The dust laden air is drawn into these tubes by a fan. The dust falls into a collecting chamber at the bottom of the vertical tubes and the dust-rid air is forced thru a screen into the atmosphere at the top of the housing. This apparatus is very efficient for many purposes. This company also makes a line of vacuum cleaners as described above.

The W. W. Sly Manufacturing Co., Cleveland, has installed its dust filters for several of the largest soapers. The company has specialized in dust control systems for years and gives large and small installations proper consideration. Its "Unit Dust Filter" consists of a small inexpensive flexible unit. It is composed of a filter case which is divided by a dust wall into a dust chamber and clean air chamber. As the dusty air is blown into the filter or exhausted into it, a baffle plate diffuses the dust over the entire dust chamber and permits the heavier particles to drop by gravity. This protects the cloth bags of special filter cloth which are inserted in slots of the dust wall. The air passes from the outside of the bag to the inside and out of the open ends. A large hopper on the bottom receives the collected dust from the outside of the bags. A shaking device facilitates the removal of this dust and keeps the bags clean. The unit is so built that all parts are very accessible and the bags are prevented from collapsing by heavy mesh wire frames. These filters are guaranteed for thorough removal of dust. Sly also makes several other types of filters which find use in numerous industries.

Pangborn Corporation, Hagerstown, Md., is well known in the dust control field. It builds numerous types of dust collectors as well as exhausters and a dust wetter. The latter is of value where it is desired to mix the dry collected dust with a regulated amount of water to produce a semi-fluid sludge for easier discharge disposal. They make a small portable unit type collector for small volume, light duty, industrial applications which might be of interest to smaller companies. Pangborn's line includes centrifugal collectors which are used as a preliminary installation for reduction of the dust load before entering the filter type collectors.

The Pulverizing Machine Company, Summit, N. J., has recently brought on the market a very efficient filter named the "Mikro Collector." This is especially useful for grinding operations and has a virtually 100 per cent efficiency. It consists of two main parts, a cylindrical bag of hard wool felt, and a hollow annular blow ring

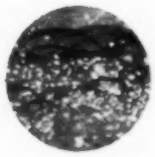
build better suds . . .

How do your soaps lather? Sudsing ability is an important consumer requirement. To improve the volume of suds produced by your detergents, let PQ Silicates be your dependable allies. Silicate also can increase the life of a soap bubble more than tenfold.

Even in hard water, PQ Silicate-built soaps are effective suds producers. Although the silicates do not prevent precipitation of hardness in water, the precipitate particles are so small and so well dispersed that they are apparent only as a turbidity and may be easily rinsed away.

May we discuss with you recent studies of the quantities of silicates that can be used in various types of soaps—liquid, bar, powdered or flakes, and the proper method of incorporation?

PHILADELPHIA QUARTZ CO., Dept. B, 129 South Third Street
Philadelphia 6, Penna.



which hugs and flexes the bag. As the latter moves up and down on the outer surface, by a chain drive, a directed jet of air is supplied by a blower through the inner periphery of the ring through a flexible hose. This causes the dust to drop into the collecting chamber at the bottom. It is claimed that while hard pressed felt is known as a most efficient filter, its pores are soon clogged. This blow ring arrangement has made the use of felt possible. We recently observed some of these collectors in operation in conjunction with one of this company's "Mikro Pulverizers" and it operated efficiently and very quietly.

Before leaving the filter type of dust collectors, it is fitting to comment upon the replacement type air filters made by Owens-Corning-Fiberglas Corp., Toledo. These filters are replaceable, impingement type, glass fiber filters coated with a viscous adhesive. They have the advantage of being non-shrinking, withstanding high temperatures, eliminating fire hazards, efficiently filtering even the finer dusts and possessing low maintenance costs. It is worth one's time to peruse carefully this company's catalog on "Dust Stop Air Filters."

Another efficient dust collector is the "Multiclone," handled by Western Precipitation Corp., Los Angeles. This consists of a small tube type of cyclonic dust collector which uses centrifugal force for separating the dust from dust-laden air. While the first "Multiclone" built was but three inches in diameter, they now have diameters from five to twenty feet. The standard tube sizes, however, are usually six to nine inches in diameter. The capacity of this system is based on multiples of the individual tubes. The makers claim their dust-collecting systems are highly efficient, compact, economical in operation and of low first cost for installation. They have a low power loss when operated by either suction or pressure. They collect from 90 per cent to 99 per cent of many types of dusts down to 1 micron in size. The Western Precipitation Co. who manufacture this collector, also specialize in the "Cottrell Electrical Precipitators."

The electrical precipitation of dust is employed more generally in large mining or smelting operations, in cement plants, in large boiler plants, in paper and other heavy chemical operations. The general principles of these Cottrell precipitation methods are to charge the dust particles by gaseous ions or electrons, transporting these charged particles to a collecting electrode, discharging the charged particles and removing the precipitated particles to a suitable collecting receptacle. The process is especially adapted to the types of dust to be controlled. These are too numerous and extensive to consider fully. Literature is available upon request to the Company.

In view of the information and equipment which is available for the elimination of dust, it behooves any manufacturer who has to contend with this problem, to obtain more information directly from dust control machinery specialists. Much valuable information is offered in the brochures offered by the companies mentioned. A close study of these aids in making one more dust-conscious and more eager to eliminate dust hazards.

Adjust Differences

Stokes & Smith Co., Philadelphia, recently announced that all differences between Transparent-Wrap Machine Corp., and itself have been amicably settled. Under the new arrangements, the "Transwrap" packaging machines will be built by Transparent-wrap Machine Corp. and the "Stokeswrap" packaging machines will be built by Stokes & Smith Co.

Floor Patching Booklet

Patching of cracks, ruts and shallow holes in concrete floors is shown and described in a new leaflet distributed recently by Smooth-on Mfg. Co., Jersey City, N. J., makers of "No. 7 B" floor patch cement. "Smooth-on" floor cement expands slightly as it hardens, thus wedging finished patches tightly into place, according to the folder. The cement comes in powder form in one, five, 25 and 100 pound containers, is mixed with water into a paste and applied with a trowel.

Givaudan Issues Catalog

Givaudan-Delawanna, Inc., New York, recently issued a new, 76-page catalog of perfume raw materials entitled "A Symphony in Fragrance." The catalog, which is divided into five sections, lists many new products, including over 250 synthetics, and an equal number of specialties. Spiral bound and having a laminated plastic cover, the catalog is printed in a number of colors and is illustrated with views of the company's plants at Delawanna, N. J. and Vernier-Geneva, Switzerland.

New Filling Machine

Packer Machinery Corp., New York, in a letter dated Feb. 3, announced the development of a new, low cost, gravity-type filling machine. The new device should be of particular interest for use in connection with filling one and two gallon cans. The filling by gravity is of importance in filling delicate liquids which can stand only limited agitation. A conversion unit is also being offered by the company which can be attached to most current vacuum type filling equipment. With the conversion attachment filling by both methods is possible.

New "Emeryfacts" Pages

Revised pages for "Emeryfacts," data booklet of Emery Industries, Inc., Cincinnati, were mailed out during February. The new pages contain more up-to-date information on company products, and are in line with the specifications of Emery's current production. The new pages cover sections I and II. The first deals with the company's fatty acids, the second section covers metal working oils and a description of the Twitchell fat-splitting process.

Soap Testing Booklet

A booklet describing a method of testing soaps, shaving creams, shampoos, cosmetics and toiletries has been prepared by Evans Research and Development Corp., New York. For the tests, nearly 1,000 men and women have been completely cross-indexed as to allergies, skin and hair characteristics—such as general condition, tex-

ture, oiliness and dryness—for testing on scientific and aesthetic grounds. The people listed are available for testing a number of products. Copies of the booklet, which also shows results of the tests from sales, advertising and research viewpoints, are available.

Metallic Soaps Booklet

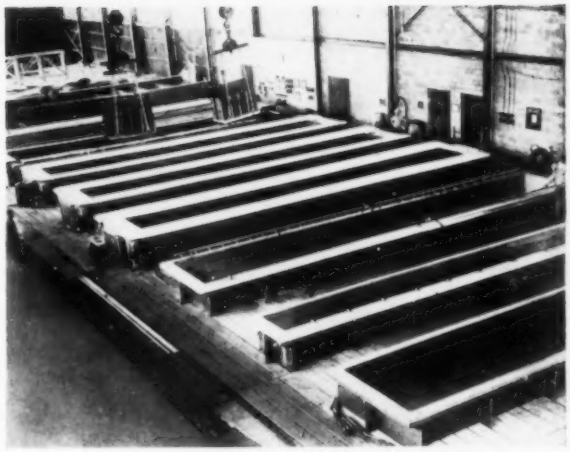
American Cyanamid Co., New York, recently issued an eight-page folder on their line of "Aero" brand metallic soaps. The Cyanamid metallic soaps are produced in a new, continuous process plant. The booklet describes the properties and specifications of the "Aero" soaps. Copies are available from the company's Industrial Chemicals Division at 30 Rockefeller Plaza, New York 20, N. Y.

New Pump Packings

A new packing, designed to overcome the necessity for frequent re-packing of pumps handling hot caustic solutions has been developed by Quaker Rubber Corp., Philadelphia, it was learned recently. The new packing is compounded to resist the damaging effects of harsh caustic solutions at high temperatures on reciprocating pumps and similar equipment. It is self-lubricating, assures minimum friction to rods and prevents costly leaks, according to company claims. For tight sealing service on centrifugal pumps handling caustic solutions, Quaker has a packing of braided asbestos. Both the company's valve and pump packing products are available in a wide range of sizes.

Folder Features New Pump

The announcement of the addition to its line of a new series of boiler feed pumps designed for pumping hot water and for other installations requiring high water pressure was made during February by Jacuzzi Bros., Inc., Richmond, Calif. In addition, the company has brought out a six-page folder illustrating and describing the new, multi-stage, centrifugal pumps, believed to be the first boiler feed pumps to be produced in vertical design. The new pumps have only one moving part. Standard units vary in size from ½ to 20 horsepower.



Right: Sodium hydride descaling plant operated by Lukens Steel Co., Coatesville, Pa., is believed to be largest of its type in the world.

New Metal Cleaning Method

What is believed to be the largest plant in existence for cleaning various types of metal-clad steel equipment is the sodium hydride descaling plant recently reported by the Lukens Steel Co., Coatesville, Pa. Appreciable savings in metal, more uniformly descaled surfaces, and shorter descaling time are said to be the principal advantages offered by the sodium hydride process over blast cleaning methods.

The sodium hydride method may be likened to alkaline pickling which requires no electric current. The scale, loosened by the hydride bath, is carried off the metal surfaces by steam which is created when the heated work is immersed in a water quench. Caustic residual is neutralized by a sulfuric acid bath before the work is ready for pickling.

Offer Sodium CMC

Sodium carboxymethyl cellulose, a relatively new commercial chemical compound for use in building soaps and synthetic detergent products, is being marketed by E. I. du Pont de Nemours & Co., Wilmington, Del. Tests have shown that Sodium CMC, improves the performance of soaps by speeding up wetting and detergent action, but that its main value is the prevention of soil redeposition in home laundering of cotton fabrics. Its use is said to be effective in preventing the characteristic grey appearance of repeatedly washed cotton goods.

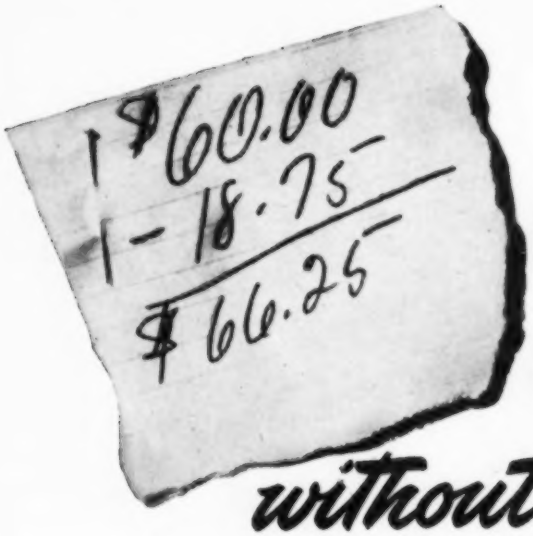
Glass Polishing Tissues

A silicone-treated paper tissue for cleaning and polishing glass that leaves an invisible silicone coating on the surface it cleans and polishes, preventing the adherence of dust, dirt, body oils, etc., was developed recently by Dow Corning Corp., Midland, Mich. In addition, the coating protects the lens or glass surface from minor scratches. Marketed under the trade name, "Sight-Savers," the tissues are strong enough to resist tearing, but remain soft and pliable.

New MRM Rotary Filler

The introduction of a new, fully automatic, rotary filler, "R-48," was announced last month by MRM Co., Brooklyn. The new rotary filler is totally enclosed in a special steel cabinet that contains the complete working mechanism. It can be adapted to handle all styles and shapes of containers and mouth openings from a fraction of an ounce through one quart, and is adaptable to quick change-overs with no loss of production time. Viscous, foamy or still liquids can be handled by this new machine which requires no skilled maintenance or operation.

A new Los Angeles branch for sales and service is to be opened by MRM, the company announced in February. The new branch will carry in stock all parts necessary to maintain and repair the company's equipment. It will also store a full line of MRM filling and conveying equipment.



How 19,000 companies up take-home pay *without upping payrolls*

Can you deduct $18.75 from $60.00 and get $66.25? *Yes.* And the way you can do it is mighty important to your company—and to the nation!

You start with $60, representing someone's weekly take-home pay. You deduct $18.75 for the purchase of a U.S. Savings Bond. That leaves $41.25. But $41.25 isn't what the worker takes home. He takes home $41.25 *plus a $25 Savings Bond.* Total (assuming he holds the Bond till maturity): *$66.25.*

WHAT 19,000 COMPANIES HAVE LEARNED

In the 19,000 companies that are operating the Payroll Savings Plan for the regular purchase of Savings Bonds, employees have been more contented in their jobs—absenteeism has decreased—even accidents have been fewer!

Those are the "company" benefits the Plan provides, in addition to extra security for individual employees.

But the Plan has other, far-reaching benefits of basic importance to both your business and the national economy...

SPREADING THE NATIONAL DEBT HELPS SECURE YOUR FUTURE

The future of your business is closely dependent upon the future economy of your country. To a major extent, that future depends upon management of the public debt. Distribution of the debt as widely as possible among the people of the nation will result in the greatest good for all.

How that works is clearly and briefly described in the free brochure shown at the right. Request your copy—*today*—from your State Director of the U. S. Treasury Department's Savings Bonds Division.

ACTION BY TOP MANAGEMENT NEEDED

The benefits of regular Bond-buying are as important today as ever—but war-time emotional appeals are gone. Sponsorship of the Payroll Savings Plan by a responsible executive in your company is necessary to keep its benefits *advertised to your employees.*

Banks don't sell Savings Bonds on the "installment plan"—which is the way most workers prefer to buy them. *Such workers want and need the Payroll Savings Plan.*

Those are the reasons why it's important to make sure that the Plan is adequately maintained in your company.

The State Director will gladly give you any assistance you wish.

"The National Debt and You,"

a 12-page pocket-size brochure, expresses the views of W. Randolph Burgess, Vice Chairman of the Board of the National City Bank of New York—and of Clarence Francis, Chairman of the Board, General Foods Corporation. Be sure to get your copy from the Treasury Department's State Director, Savings Bonds Division.

The Treasury Department acknowledges with appreciation the publication of this message by

SOAP & SANITARY CHEMICALS

This is an official U.S. Treasury advertisement prepared under the auspices of the Treasury Department and the Advertising Council

New Floor Coating

"Oil - Dri," a new, abrasive, anti-slip floor coating, produced by Oil-Dri Corp., Chicago, is described in a folder just issued by the company. The product, which is applied like paint, dries to a rough, wather-resistant finish designed to prevent accidents from slipping and the like. It is recommended for loading and unloading platforms, inclines, steps, floors, aisles, basements and particularly factory floors. It is said to adhere firmly to wood, concrete, steel, aluminum, solid and perforated areas. "Oil-Dri" is available in gray, red or black, and comes packed in five-gallon pails, one gallon cans and one quart cans.

New Twin-Tub Mixer

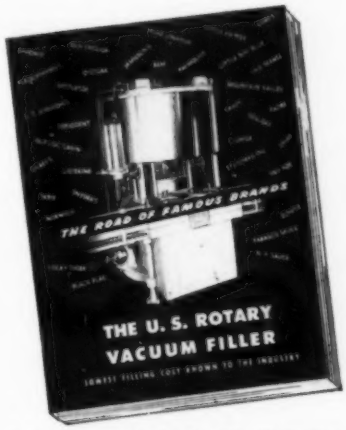
The availability of a new, twin-tub paste mixer was announced Feb. 12 by Morehouse Industries, Los Angeles. The new mixer is made in individual tub capacities of 110,150 and 225 gallons. A full variety of electrical and drive equipment is available for the unit, which is supplied with or without such accessories. Adjustable blades revolve at approximately 60 r.p.m. The company also makes the "Hy-R-Speed" mill.

Polishing Cloth for Glass

E. I. du Pont de Nemours & Co., Wilmington, Del., announce a new, chemically-treated, glass cleaning and polishing cloth that is said to prevent "fogging" of either eyeglasses or windshields after use. It is a cloth that has been soaked in a solution of synthetic detergent, tannic acid, glycerine, water and dye and then is dried. It may be re-used a number of times.

Miller Revamps Literature

A complete selection of sales helps, including envelope enclosures, testimonial letter brochures, etc., is now available to jobbers handling its line, it was announced recently by Frank Miller & Sons, Chicago. The company, which manufactures "Florsweep" and "No-Spot" sweeping compounds, recently revamped its sales literature for the jobbing trade. Samples of the company's literature or products are available on request.



A new, comprehensive bulletin illustrating new mechanical container filling equipment made by U. S. Bottlers' Machinery Co., Chicago, was issued recently and is now available the company announced during February. Featured are five new models of the U. S. rotary vacuum fillers.

Moisture Measuring

A comprehensive description of a complete line of electric hygrometer equipment suitable for exacting industrial and laboratory applications is contained in a recently issued, 28-page bulletin of American Instrument Co., Silver Spring, Md. In addition, the booklet gives data on various industrial and laboratory applications, as well as selection charts, diagrams and calibration curves.

Engineers New Tank

By the use of the company's patented "curve - of - strength" construction it is often possible to provide stainless steel equipment at a price comparable to or less than that of wood or iron, according to a recent release of the Textile Machinery Division of Rodney Hunt Machine Co., Orange, Mass.

New Type Water Softener

Rathburn Co., Houston, Tex., recently issued a circular illustrating and describing the new, "Soft Flow," faucet model, water softener. The new water softener fits over the faucet and is fitted with a strap for hanging up when not in use. There is also a "jumbo" size soft flow water softener designed especially for use in laundering and bathing.

Flow Measuring Kit.

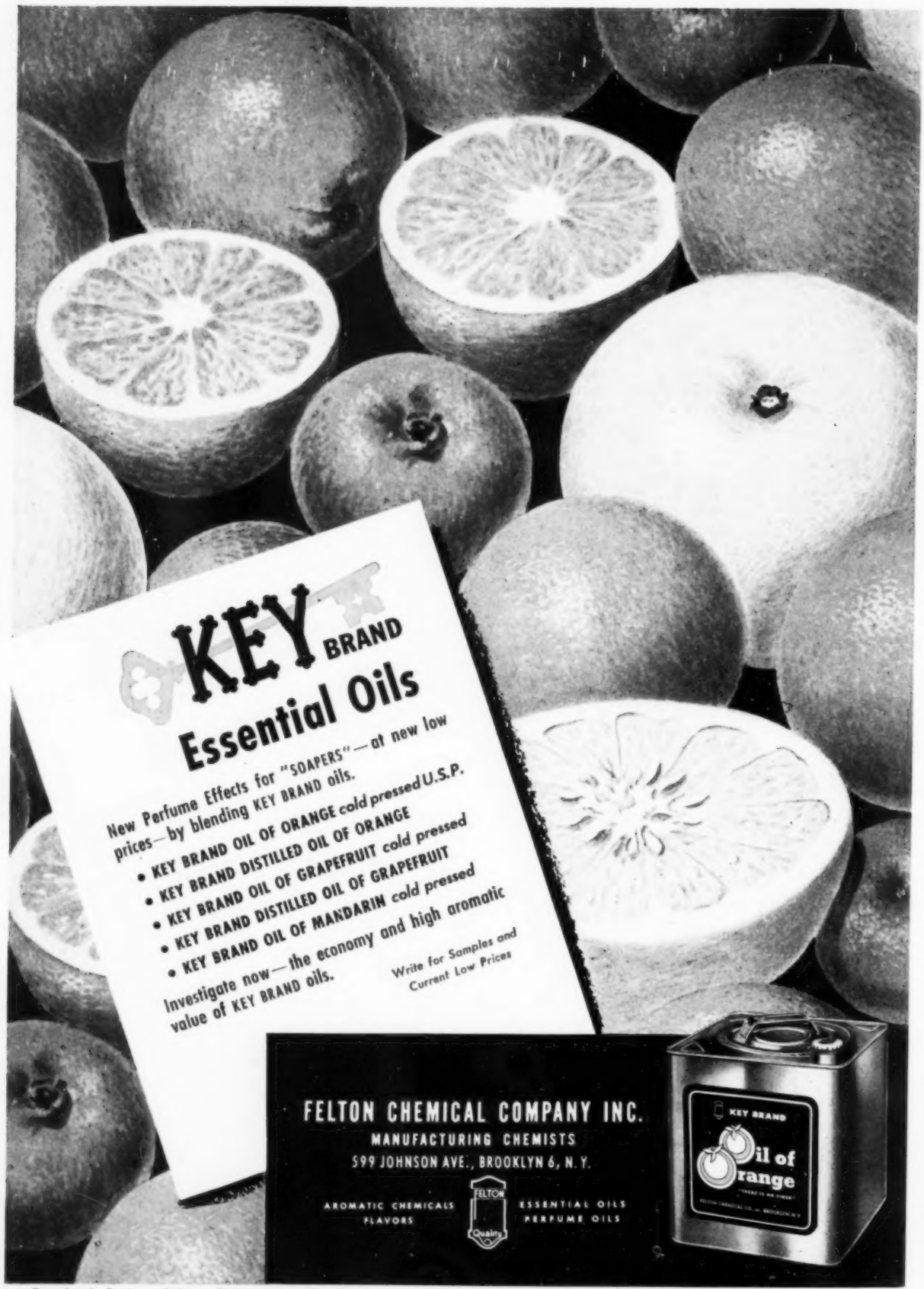
Fischer & Porter Co., Hatboro, Pa., recently announced a new laboratory kit of the rotameter type for measuring flow. The set consists of a metering tube holder with base plate and hose connectors, four interchangeable tubes and six metering floats complete with calibration data. Capacities from 0.065 to 2200 cc/mm of water and 5.0 to 36,800 cc/min. of air are covered.

New Gov't Patent List

A list of 65 government-owned inventions suitable for patent protection in foreign countries was released Feb. 10 by the Office of Technical Services, Department of Commerce, Washington, D. C. The inventions include products and processes of interest to the chemical drug, textile and other industries. The list is the third to be released by OTS in accordance with the President's Executive Order 9865. The order authorizes the Commerce Department to acquaint private industry with Government owned inventions for which patent applications may be filed abroad in the name of the Government for the general benefit of American industry. Copies of the list of inventions and of the two lists previously released by the OTS are available free of charge from the Office of Technical Services, Department of Commerce, Washington 25, D. C.

New Glyco Esters

Three new water-soluble esters for use as special detergents penetrating agents, plasticizers and emulsifying agents were placed on the market in February by Glyco Products Co., Brooklyn. Chemically, the products are polyoxethylene oleates and laurates having a molecular weight above 800. They are non-ionic, non-toxic, light in color and fluid or grease-like in consistency. They are soluble in water, alcohol, esters, hydrocarbons and fatty oils. At 20° C. they are slightly heavier than water. All have high boiling points and exhibit surface-active properties. The esters are sold under the names of "Polyethylene Glycol Mono Oleates S1005 and S1010" and "Polyethylene Glycol Mono Laurate S1019."



Branches in Boston • Dallas • Philadelphia • San Francisco • Los Angeles • St. Louis • Chicago • Montreal • Toronto • Vancouver • Winnipeg

PRODUCTS AND PROCESSES

Cold-process Soap

A mixture of rosin and oil or fat treated with caustic potash in a quantity insufficient to saponify the whole of the rosin, is added to the main mixture of alkali and grease in a crutch pan or other soap-making vessel. The whole is mixed thoroughly. The mixture is then allowed to thicken in the vessel and to remain in it until the mass again becomes liquid. Additional alkali is then mixed with the mass to complete the saponification before the soap is discharged from the vessel. W. H. Elliott and J. Blackman. British Patent No. 575,949.

Paint Remover

A remover for paint, varnish, enamel, and lacquer, which will adhere to inclined surfaces by virtue of the high-viscosity cellulose acetate included, will not evaporate for some time because of the surface film formed by the paraffin wax, and will loosen the paint so that with less scraping than usual the paint may be flushed away by a stream of water, is formed from acetone 53.5 parts by weight, ethylene chloride 25.0, water 10.0, lactic acid 3.5, paraffin wax 1.0, cellulose acetate 3.0, sulfonated castor oil 3.0, and diamylamine phosphate 1.0 parts. The lactic acid greatly increases the effectiveness of the composition. H. Packer, U. S. Patent No. 2,418,138.

Emulsifying Agent

Aliphatic ethers of halogen alkyl sulfonates useful as emulsifying and washing agents, are prepared by reaction between an alcoholate and a sulfonate of an aliphatic compound containing halogen atoms. R. C. Smith, to Colgate-Palmolive-Peet Co. U. S. Patent No. 2,427,576.

Polishing Abrasive

An abrasive comparable to the better grades of iron oxide rouge is prepared by grinding natural zircon to pass a 325-mesh screen, and classifying the ground particles in water suspension, by allowing all particles coarser than five microns to settle out. The suspended fines are acidified to a pH between 6 and 7 by addition of an acid salt. The zirconium silicate is removed from suspension, dried, and reground. W. T. Maloney. U. S. Patent No. 2,427,799.

Synthetic Waxes

Synthetic hard waxes are prepared by esterifying pentaerythritol or its poly form, with saturated fatty acids and maleic anhydride. The waxy products are compatible with all common natural waxes, are not appreciably soluble in water or organic solvents except hydrocarbons, and may be emulsified to form paste waxes useful in polishes. Use of stearic acid in the product gave a hard, light-brown wax melting at 65.2°C. Sward hardness was 44 as compared to 18 for natural yellow carnauba wax. Mixing 50 parts of the wax with 25 of rosin gave a soft wax resembling beeswax. Other synthetic waxes were prepared by using in place of stearic such acids as lauric, myristic, palmitic, oleic, or mixed fatty acids. H. Burrell, P. I. Bowman, and R. H. Barth, to Heyden Chemical Corp. U. S. Patent No. 2,427,255.

Sludge Remover

Sludge deposits may be removed from the interior parts of internal-combustion engines by a composition containing 50-80 per cent by volume of organic esters as solvents, 4-25 per cent water for flaking off lacquer-type deposits not attacked by the solvents, 15-25 per cent oil to lubricate and prevent rusting of the metal surfaces after cleaning, and 5-20 per cent amine soap to render the mixture homogeneous. The organic esters recommended are an acetate ester of a glycol monoalkyl ether and methyl amyl acetate. G. M. Skinner, to National Carbon Co., Inc. U. S. Patent No. 2,418,908.

Detergent Paste

An all-purpose detergent paste is prepared by heating together trisodium phosphate, 2-3 times its weight of water, 0.5-5.0 per cent of a sulfated synthetic detergent, and 1.0-5.0 per cent of alkali-metal or hydroxyalkyl amine soap. A gel is formed on cooling. Pine oil and fluorescein may be incorporated. J. Kamlet, to Boyle-Midway, Inc. U. S. Patent No. 2,421,703.

Amine Derivatives

A primary aryl amine containing an aliphatic side chain, such as para-aminolauranilide, is heated with a reducing sugar such as glucose, in a methanol:water mixture, until solution occurs. Hydrogenation in the presence of a nickel catalyst is then carried out. The complex amines formed are dispersing agents and textile assistants. Soc. pour l'ind. chim. a Bale. British Patent No. 589,535.

Water Softener

An agent for use in conjunction with lime-soda water softening to improve the effectiveness of the softening process and facilitate flocculation of suspended solids, is prepared by reacting aluminum sulfate and caustic soda, and incorporating in this mixture starch and aluminum hydroxide. J. Samuel and G. Hopkins, to Unifloc Reagents Ltd. Canadian Patent No. 446,327.

Noncaking Laundry Sour

Addition of 1-2.5 per cent of zinc oxide or zinc carbonate to a laundry sour composition of 5 per cent sodium tetraphosphate, 50 sodium acid sulfate, and 45 sodium acid fluoride, inhibits caking and formation of hydrogen fluoride in the composition. The zinc compound probably exerts its beneficial action by forming a surface film on the particles of one of the components. L. R. McCoy, to Wyandotte Chemicals Corp. U. S. Patent No. 2,426,836.

Improves TSPP

A free-flowing, readily soluble tetrasodium pyrophosphate is produced by partially hydrating the salt within the range of 15-30 per cent of water. Such a salt containing 22 per cent of water had a rate of solubility twice that of the anhydrous salt. A. C. Aitchison, to Westvaco Chlorine Products Corp. U. S. Patent No. 2,427,642.

NEW PATENTS

Conducted by
Lancaster, Allwine & Rommel

PATENTS, TRADEMARKS AND COPYRIGHTS

402 Bowen Building,
Washington, D. C.

Complete copies of any patents or trade-mark registration reported below may be obtained by sending 50c for each copy desired to Lancaster, Allwine & Rommel.

No. 2,433,661, Method of Bleaching, patented December 30, 1947 by Clifford A. Hampel, Painesville, Ohio, assignor to The Mathieson Alkali Works, Inc., New York. Subjecting the material to be bleached to the action of an aqueous, non-acidic solution containing a compound selected from the group consisting of chlorites of alkali metals and alkaline earth metals and a compound selected from the group consisting of persulfates of alkali metals and alkaline earth metals.

No. 2,433,662, Chlorite Bleaching of Fatty Acid Compounds, patented December 30, 1947 by Clifford A. Hampel, New York, assignor to The Mathieson Alkali Works, Inc., New York. An aqueous solution having a pH not less than about 7 and containing in solution a chlorite and a persulfate.

No. 2,433,831, Aqueous Dispersions of Vulcanized Fatty Oils, patented January 6, 1948 by Laszlo Auer, South Orange, N. J. An oil-in-water dispersion the dispersed phase of which incorporates a fatty oil having a water soluble soap thoroughly dispersed therein, the cation of said water soluble soap being a member of the class consisting of alkali metals, ammonium and organic amines, said fatty oil being a heat bodied oil which is in a fully vulcanized state, and said water soluble soap is produced in situ during the preparation of the heat by water soluble compounds containing cations which form water soluble soaps with fatty acids.

No. 2,434,564, Substituted Nitro Aromatic Amines as Insecticides, patented January 13, 1948 by William F. Hester, Drexel Hill, and W. E. Craig, Philadelphia, Pa., assignors to Rohm & Haas Co., Philadelphia. An insecticidal composition containing as an active principle a compound of the formula:

$$(NO_2)n—ArNHCH_2CH_2Z$$

wherein Ar is an aryl nucleus selected from a member of the benzene and naphthalene series, Z is a member of the class consisting of —OH,—OH, and —OCOR groups, and n is an integer having a value from one to two, inclusive, R being a hydrocarbon group selected from the aliphatic, aromatic, and alicyclic series, and a carrier therefor selected from the class consisting of inert finely divided solids and organic solvents.

No. 2,434,674, Fused Unitary Vitreous Composition for Use as a Detergent, Water Treating Agent, and Deflocculant, patented January 20, 1948 by Alexis G. Pincus, Southbridge, Mass., assignor to American Optical Co., Southbridge, Mass. A fused unitary vitreous composition which is soluble to a marked extent in water and is adapted to act as a cleaning agent and as a water softening agent, said fused unitary vitreous composition consisting of silica within the range of 50 to 80 per cent by weight, sodium oxide within the range of 20 to 50 per cent by weight and phosphorous pentoxide from a fraction of 1 to 12 per cent by weight.

No. 2,435,005, Skin Protective Ointment, patented January 27, 1948 by Walter F. Huppke, New York, and Axel L. Sodergreen, Great Neck, N. Y., assignors to West Disinfecting Co., Long Island City, N. Y. A protective cream consisting of an alcogel of an inorganic gelatinous hydrous oxide having adsorbed thereon an organic skin protective compound substantially insoluble in water but soluble in alcohol, and including also a film-forming composition and a volatile solvent for the latter, said composition being of character to form a flexible porous film upon evaporation of the solvent.

No. 435,013, Thioethers of Androstene-3-one-17-ols and Process of Making Same, patented January 27, 1948 by Karl Miescher, Riehen, Switzerland, assignor to Ciba Pharmaceutical Products, Inc., Summit, N. J. A 3-thioenol ether of an androstene-3-one-17-ol which contains in the 17-position a member selected from the group consisting of saturated and unsaturated hydrocarbon radicals.

No. 2,435,014, Halogenated Condensation Products, patented January 27, 1948 by Joseph B. Niederl, Brooklyn, The insecticidal and bactericidal products β, β, β-trihalo-α, α-bis (2-hydroxy-3-alkyl-5-tt-octyl-phenyl) ethanes.

No. 2,435,145, Method for Producing Solid Stabilized Polysulphides, patented January 27, 1948 by Andre Lalande, Paris, France, assignor to Produits Chimiques de Ribecourt, Paris, and Compagnie de Produits Chimiques et Electrometallurgiques Alais, Froges et Camargue, Paris. A method for stabilizing barium polysulphide chiefly for insecticidal, fungicidal and the like agricultural purposes which comprises concentrating a solution of said polysulphide in water in presence of alphamonochloronaphthalene until a granular powder is obtained.

Refining Apparatus

Oil of animal or vegetable origin is subjected to aeration prior to being heated to a high temperature in an apparatus designed for the purpose. The raw feed, which may be either cold or moderately preheated flows first to the upper section of the aerating chamber and then downward over a plurality of trays which may be bubble caps. Stripping steam is injected into the lower portion of the deaerating section. Steam, vapors and noncondensible gases are removed from the chamber. This method reduces the volume of volatile components of the treated oil. D. K. Dean, to Foster Wheeler Corp. U. S. Patent No. 2,422,185.

Tall Oil Hydrogenation

Tall oil fatty acids or crude tall oil are pretreated with up to 2 per cent of caustic soda or 2-10 per cent of an alkali metal salt, then hydrogenated in the presence of 0.2 per cent of the usual hydrogenation catalyst. The percentages are based on acid content of the tall oil. Hydrogenation was carried out in a Parr bomb with nickel formate as catalyst at 1500 pounds per square inch at 150°C. J. Harwood and E. F. Binkerd, to Armour & Co. U. S. Patent No. 2,423,236.

Manganese from Water

Manganese is removed from water by coagulation with ferrous sulfate at a pH of 8.8, followed by filtering. A. H. Ullrich, *Southwest Water Works J.* 29, No. 6, 26-8 (1947).

SADDLE SOAPS

(*From Page 45*)

	Parts
Potassium carbonate	25

Dissolve by the aid of heat and add:

	Parts
Beeswax	140

Continue heating, and then add a warm solution of:

	Parts
Castile soap	50
Water	250

Mix, remove from the heat and stir in:

	Parts
Oil of turpentine	285

Somewhat similar in that it also contains beeswax and turpentine is an American formula for a saddle soap. As given in Bennett's reference text (14) the product is made from:

	Parts
Beeswax	50
Caustic potash	8
Water	80

Boil for five minutes while stirring. In another vessel heat:

	Parts
Castile soap	16
Water	80

Mix the two with good stirring, remove from heat and, while stirring add:

	Parts
Turpentine	120

The nourishing and softening effects of neatsfoot oil are utilized in the following saddle soap formula: (13, 14)

	Parts
Palm oil soap chips	8.00
Water	24.00
Beeswax	1.50
Neatsfoot oil	1.25

Dissolve the soap chips in the hot water. Melt the wax with the neatsfoot oil, and add the mixture to the soap solution. Stir until the mix begins to thicken and pour into cans. If desired, the paste may be colored by adding a small proportion of a 2 per cent solution of Du Pont Orange No. 110 to the hot soap solution.

Using the same procedure, a modified version of the above saddle soap calls for the use of: (14)

	Parts
Powdered soap	15
Water	72
Beeswax	8
Neatsfoot oil	5

Borrowing a principle widely employed in the formulation of shoe polishing pastes, (16) a commercially useful saddle soap can be prepared with a mixture of ceresine, beeswax and paraffin wax. According to Smith, (4) such a product is made from:

	Parts
Olive oil soft soap	100
Mixed waxes	80
Turpentine	40
Ammonia soap	10

The mixture of waxes, turpentine and ammonia soap is crutched into the soft soap.

Another modified saddle soap which possesses marked polishing qualities because of its carnauba wax content consists of: (8)

Water	½ gal.
Castile soap	1¼ lb.
Tallow	1 lb.
Yellow carnauba wax	2 lb.
Turpentine	½ gal.

Dissolve the soap in the water and incorporate the tallow. Separately melt the wax, dilute with the turpentine and transfer to the hot soap solution.

A high proportion of carnauba wax also characterizes the formula for the saddle soap given below: (14)

	Parts
Carnauba wax	54
Soap flakes	20
Tallow	26
Turpentine	21
Sperm oil	6
Water	5

As mentioned earlier in this discussion, the use of carnauba wax emulsions in saddle soaps offers interesting potentialities and is well worth further study. One emulsion that may be tried for such purposes may be prepared from: (11)

	Parts
Carnauba wax	87.0
Triethanolamine	4.9
Stearic acid	9.0
Water	400.0

Place the water, triethanolamine and stearic acid into a suitable vessel and heat to 100°C. After the stearic acid has melted completely, allow the mixture to boil gently. Stir carefully so that a smooth soap is obtained. In a separate, steam-heated container, melt the wax and bring the temperature to between 85° and 90°C. Now add the hot, melted wax to the boiling soap solution and stir vigorously until an even dispersion is obtained. Continue stirring gently until the emulsion has cooled to room temperature in order to prevent the emulsion from becoming too viscous or the wax from graining out.

Of interest in connection with triethanolamine is its value as an addition to saddle soap compositions. One authority (4) in this field recommends its use because it greatly increases the scouring or cleansing action of the soap and helps to leave the grain with a smooth, silky feel. He believes, however, that the cost of triethanolamine is the main reason why this additive is not included in most working formulas. In an earlier report, this worker (5) had noted that good leather cleaning results could be obtained by adding a suitable solvent to a soap prepared from triethanolamine and stearic acid. He recommended the use of one of the chlorinated solvents or hexalin or tetralin, but remarked that the straight petroleum distillates also gave reasonably good results.

Also worthy of mention is the use of another soap of this kind, triethanolamine oleate (made from 33 per cent triethanolamine and 66 per cent oleic acid) in the formulation of general shoe cleaners. A product of this type, cited by John, (8) contains:

Water	6 gal.
Triethanolamine oleate	2 lb.
Potassium carbonate	4 oz.
Alcohol	1 qt.

When making older types of saddle and leather soaps, it was quite common practice to include a small proportion of a tanning agent with the soap. The idea behind such addition was that this nourished the leather and helped to replace some of the tanning material which may have been lost during the cleansing procedure. (4)

This point is of interest because tanning agents are included in patented leather washing compounds based on synthetic detergents. (17)) Of course, the potentialities of the synthetic detergents have not been ignored in the formulation of leather cleaning compositions. (18) Nearly a decade ago, a European worker (19) stated that compositions suitable for cleaning leather goods could be made with sulfonated higher alcohols or organic solutions of sulfonated aliphatic esters in combination with soluble oils.

At about the same time, the patent (17) mentioned above was issued. It described the production of compounds for washing leather goods comprising mixtures of tanning agents with various synthetic detergents that remained active in an acid medium. Among the compounds suitable for this purpose are the sulfonated higher aliphatic or cycloaliphatic alcohols or their alkali or amine salts, such as sulfuric acid esters of dodecyl, tetradecyl, cetyl, octadecyl, octadecenyl or naphthene alcohols. In an example given in the patent, gloves may be washed at below 40°C. with a solution containing 10 to 20 Gm. per liter of a mixture of equal weights of chromium acetate, oleic acid tauride and the sodium salt of octadecenyl alcohol sulfuric acid ester.

The industrial literature on synthetic detergents occasionally mentions the use of such compounds for cleaning leather goods. One publication (20) recommends the use of one heaping teaspoonful of a sodium salt of an alkyl aryl sulfonate ("Nacconol N R") dissolved in a quart of warm water to provide a neutral, efficient solution for cleansing of leather gloves, shoes and the like.

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FATTY ACIDS

(*From Page* 48)

table fatty acid fractions appear to permit an equal or slightly higher real soap content than commercial oleic acid. Similar observations have been noted with potash soaps prepared from each of these fatty acids in admixture with coconut fatty acid.

Another observation is that liquid soaps prepared from equal mixtures of coconut and oleic or these other fractions permit as high a real soap content as does straight coconut fatty acid. This real soap content appears to be approximately 36 per cent. Up to five per cent stearic or palmitic acid contents appear to have very little effect on liquid potash soap viscosity. Myristic has some reducing tendency and lauric, of course, has a pronounced effect in reducing viscosity. It is of further interest that mixtures of palmitic and lower-molecular weight acids reduce viscosity more than the individual fatty acids.

We have already indicated the advantages of linoleic-free oleic and mixed fatty acids for both soda and potash soaps. Commercial production of such quality fatty acids later this year will offer an opportunity to confirm these beliefs in commercial operations.

PALM OIL

(*From Page* 49)

ropean trade channels. The result was a reduction of imports from the 1936-39 level of 330 million pounds per year to 58.5 million in 1943-47.

In order to obtain the best distribution of the limited and uncertain supply, the government assumed a monopoly of imports and distribution. The Office of Production Management, succeeded by the War Production Board, issued General Imports Order M-63, effective December 28, 1941. Palm and coconut oils and copra were the first oils specified January 13, 1942. The control of food imports was centralized in the War Food Administration of the Department of Agriculture November 13, 1944. G.I.O. M-63 became War Food Order 63 and the Production and Marketing Administration became responsible. Palm oil still remains under this control. The allocation of palm oil to world markets was the function of the International Emergency Food Council of the United Nations. In 1943, the use of palm oil in foods was proscribed. The pre-war consumption had amounted to 132 million pounds annually. In the years 1943-45, palm oil was used almost exclusively as a soap making oil and in tin and terne plating. As stocks continued to decrease, the amount allotted to soap was sharply curtailed to 7.4 million pounds in 1946. In addition, the government endeavored to increase the supply from the Congo.

Early in 1947, the proposal was to obtain 65 million pounds of palm oil from the Belgian Congo in exchange for authorizations for purchase of 55 million pounds of domestic oil represented by 15.9 million pounds of lard, 107 million pounds of protein meal, 38 million pounds of shelled peanuts, and 19.7 million pounds of vegetable oils. The 10 million pound difference in oil equivalent is said to represent the undelivered deficit of 1946. As a result, imports of Congo palm oil rose from 35 million pounds in 1946 to about 53 million in 1947. There is, then, a deficit of 12 million pounds carried over. It is unlikely that the Congo will do better on shipments to the U. S. in 1948.

The Netherlands Indies thus retains its historic role as the supplier of the American market, and significant relief from the long-continued shortage apparently will depend upon this source. The Japs are reported to have

destroyed most of the processing facilities of Sumatra. The plantations have been neglected for years. The serious and protracted political difficulties have prevented a recovery of the industry. Until plantations and factories are once again rehabilitated, the domestic supply will continue at present levels. That imports from the Indies will approach pre-war tonnages before 1950 seems unlikely. It is improbable that palm oil will be available for soap making in significant amount in 1948.

Brighten Worsted Goods

Checked worsted fabrics may need a special scouring in order to come out with the colors bright. For this, use 4 ounces of soap and 2 ounces of a "mild" alkali per gallon of water. Boil for 3 hours. Complete the scouring bath by adding cold water with stirring. Scour the goods in this for 20 minutes. If the lather shows signs of dirt, run it off, and add 2-3 pails of fresh soap solution for each piece of goods and scour another 20 minutes. *Textile World* 97, No. 9, 190 (1947).

Synthetic Soap Cake

The development of a synthetic detergent in tablet form, known as "Licoso Nusope," has been reported by Advanced Chemical Industries, Ltd., Kirkby, Liverpool, England. It is claimed to give a rich lather, good detergency, and have a hardness suitable for wash-stand use. The company feels that it has been successful in attaining these advantages due to the nature and proportion of binders and fillers incorporated. The product has a pH of approximately 7 and is claimed to be satisfactory for use on the most tender skin. There is no need to dry the product between uses. The company is represented in the United Stataes by Mrs. E. Berlage, 424 E. 52nd St., New York.

Principles of Detergency

Detergency curves show the existence of a critical washing concentration which is characteristic of each detergent and which coincides with its critical concentration of colloid formation. Detergent action, colloid formation, and surface-activity are different manifestations of the same characteristic of the detergent. The long-chain ion is the active constituent in each manifestation.

Colloid formation begins, and washing power and surface activity reach their maximum, at the concentration at which further additions of detergent either (1) do not dissolve, as at low temperatures, or (2) form colloid, as at higher temperatures. Thus in neither case is further increase in the number of long-chain ions in the solution possible. The critical washing concentration is essentially a function of the length of the nonpolar portion of the detergent. A difference in polar groups, such as carboxyl, sulfate, or sulfonate, is of less importance than the length of the hydrocarbon chain. Solubilization of foreign matter is a function of the colloidal micelle and plays a secondary role in the usual washing process. W. C. Preston, *J. Phys. & Colloid Chem.* 52, 84-96 (1948).

Avoiding Soap Dust

The undesirable tendencies of soap granules, chips, flakes, beads, etc., to form dust during storing and handling, and to clump in water, can be counteracted by coating the soap particles with soluble silicates, which may be used in conjunction with various water-soluble gums and waxes such as "Carbowax," or with low-melting water-insoluble waxes such as paraffin. Pigments may be admixed. The silicate is preferably applied to spray-dried soap particles by simultaneously tumbling and spraying them at 70-90°F. with a 28 per cent aqueous solution of silicate containing $Na_2O:SiO_2$ of 1:3.26. As little as 2 per cent of silicate exerts the desired effect. This treatment counteracts the caking tendencies of granular soap powders containing large proportions of hygroscopic components such as soda ash.

Tendency to form dust can also be prevented by incorporation of 0.5-3 per cent of a kerosene or heavier mineral-oil fraction, by addition to the soap in the crutcher prior to formation of soap particles. Builders may be present. Mineral-oil addition to synthetic detergents to be produced in granular or bead form is also effective in preventing dust formation. R. F. Heald and M. L. Givan, S. J. Holuba, to Colgate-Palmolive-Peet Co. U. S. Patents 2,423,449-51.

Tocopherol Antioxidant

Comparison of the antioxidant properties of tocopherols at concentrations of 0.02 and 0.1 per cent in lard, by means of a modified Swift Stability Test, show an order of increasing antioxidant effectiveness of *alpha, beta, gamma, and delta.* J. Griewahn and B. F. Daubert, *J. Am. Oil Chemists' Soc. 25*, 26-7 (1948).

Synthetic Castor Oil

Air passed through peanut oil at 70°C. with a nickel catalyst gave a hydroxylated oil similar to castor oil. The product was slightly higher in specific gravity, viscosity, saponification number, and molecular weight than castor oil. M. Goswami, G. Modak, and A. Dutta, *Science and Culture 12*, 555 (1947).

Surface Tension Studies

The surface tension of an aqueous solution has long been recognized as one of the more important physical properties controlling its wetting and detergent powers. Factors other than solute concentration influence surface tension; the condition of the surface must also be taken into account.

Thus, the surface or rather interface age involved in many detergent processes does not exceed a few seconds, and much of this time may be required for the establishment of diffusion equilibrium. For dilute solutions of long-chain compounds, the operative dynamic tension may vary over a range of 40 dynes per centimeter, and acknowledgment of the time required for surface equilibrium is clearly essential. A further factor, the change in equilibrium surface tension which occurs during change in area of a soluble film, has not previously been considered, but may prove of considerable significance. C. C. Addison, *Nature 160*, 467 (1947).

SODIUM CMC . . .

(*From Page 39*)

badly. Illustrated in Figure 4 is the towel which was cut into three strips, the outer two being washed with the center panel left untouched for comparative purposes. By commercial laundry standards, the towel was completely unreclaimable. While the towel, of course, was not returned to the original whiteness, its condition was acceptable and only faint scorch marks remained where the damage had been the heaviest.

Although the principles underlying the detergency promoting properties of sodium carboxymethyl cellulose are not clearly understood, it is conjectured that its principal function is to increase the colloidal and micelle forming characteristics of the synthetic detergent. Fatty acid soaps in solution exist in a highly colloidal form and exhibit a strong micellular formation. Lacking this colloidal property, the synthetic detergent in admixture

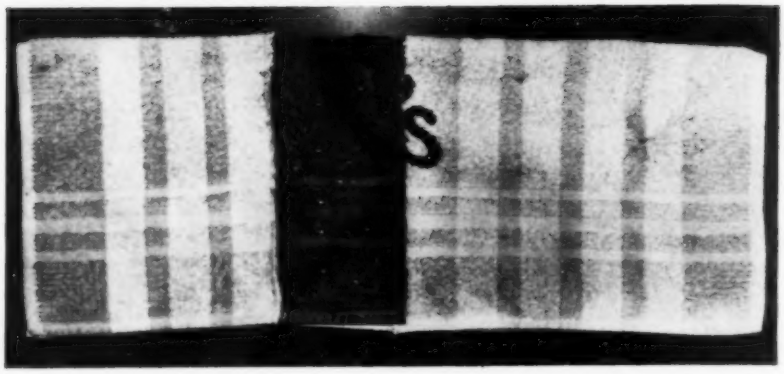

Figure 4

with sodium carboxymethyl cellulose may then exhibit to the greatest degree its superior detergency. This hypothesis, even if correct, does not, of course, comprise the whole story. In addition to the other known factors such as water softening properties and the fact that sodium carboxymethyl cellulose exhibits some detergency when used alone, there may be other favorable factors at work. Whatever the true underlying causes may be, the unique properties inherent in sodium carboxymethyl cellulose make it appear probable that this compound will prove to be one of the most important developments in detergency, rivaling in importance the advent of the synthetic detergents.

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PREMIUMS

(*From Page 42*)

retail for 35c to $1.00 and the balance is in higher priced articles.

As is the case with all premium offers, the coupon plan must be advertised if it is to achieve maximum success. The cooperating companies in our plan believe in strong promotion of their premium offers. As an example, Borden is currently running a spectacular newspaper campaign in 60 or more cities, featuring outstanding premiums. Ballard has a radio program on most of the southern stations. W. B. Reily has been conducting a house to house distribution—General Foods and Mrs. Filbert have been putting up posters in the grocery stores. All this advertising features particular premiums and of course plays up strongly the product of the manufacturer promoting the campaign. But it also stresses the other products represented in the cooperative plan and emphasizes the advantages of saving coupons from all of the associated products. It would be difficult to overestimate the value of this cross-advertising.

In addition to separate advertising activities by individual companies, all companies at times combine in running a combination campaign. This most often consists of the distribution from house to house in urban sections, and by mail in rural sections, of an eight-page tabloid folder which illustrates a selection of the most attractive premiums. This is one of the biggest distribution jobs undertaken anywhere. There is hardly a home in our operating territory from Maine to Florida and west to the Mississippi that does not get one of these colorful folders telling our premium story.

One of our men who likes figures worked out the statistics of the paper used in producing one of these folder editions. The edition required 24 carloads, 1,425 tons, which stretched end to end would have reached 32,386 miles—almost 1-1/3 times around the equator, or laid one on top of one another would have made a pile 15,504 feet high or 12½ times as high as the Empire State building.

Any manufacturer who has his article represented as a premium in these folders, gets a whale of a lot of good advertising to say nothing of the resulting business.

This quick summary will give you a general ideal of the way we operate the coupon plan. We use the slogan "It pays to save the Coupon" and we are constantly striving to make good on that. As a result the Octagon Coupon has become a recognized value —a medium of exchange highly regarded by the consumer everywhere. Thus the coupon plan performs for us its function of *creating new customers* and *holding the present users*—Keeping them "in the barrel" so to speak.

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Phase studies show that it is possible to predict the degree of separation which can be obtained with any given mixture of oleic acid and stearic acid, using either acetone or commercial hexane as solvent. Oleic acid of high purity can be obtained as one of the practical applications of these data. W. S. Singleton, *J. Am. Oil Chemists' Soc.* 25, 15-20 (1948).

SANITARY PRODUCTS

A SECTION OF SOAP

AMONG the manufacturers of household insecticides, estimates as to the general sufficiency of stocks of insect sprays, aerosols, roach powders, bedbug liquids and the like on the shelves of jobbers and retailers vary considerably. Some feel that distributing channels are still overstocked. But more opinions incline to the idea that in spite of a restricted retail demand over the past two years, this demand has exceeded the rate of sales by manufacturers and there has been a gradual reduction in retail stock.

Some of those who express this latter opinion go further and state that if we have even a normal average household insecticide year in 1948, present combined stocks of manufacturers and dealers will not be adequate. And if 1948 turns out to be a heavy bug year in mid-season, it will then be too late to prevent a first class scramble in both finished goods and raw materials. There are also those who scoff at any such development. Nevertheless, this has happened before and it could happen again. Obviously, manufacturers grossly oversold jobbers and dealers two years or so ago when the big DDT boom was on. But they did not oversell them to the point that the insecticides on hand are going to last forever.

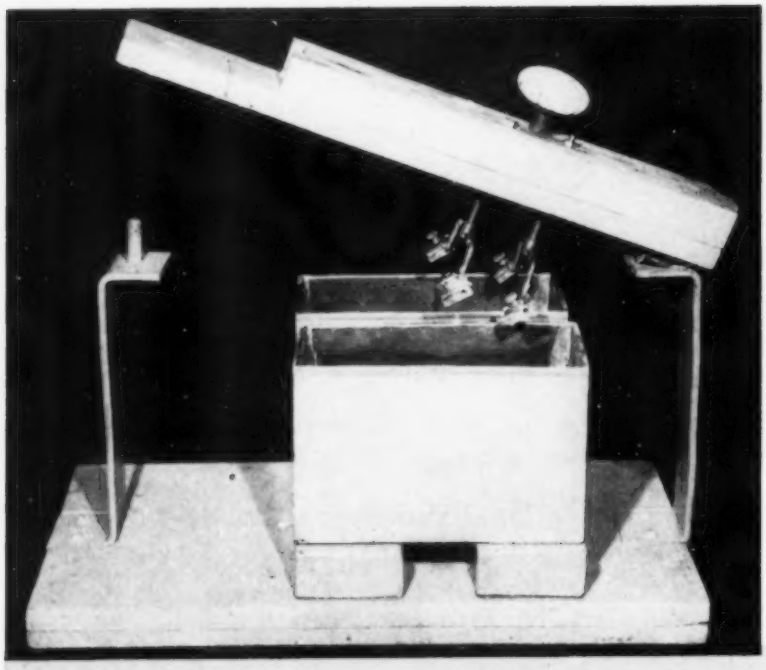
What the household insecticide industry could use to great advantage over the next few months is a barrage of newspaper publicity aimed to revive the public consciousness in all bugs,—a feeling probably lulled to sleep by two "bugless" seasons.

DEAD from DDT poisoning! That was the verdict following the death of a fifty year old Chicago man recently. Supposedly, this man drank four ounces of five per cent DDT in oil before he realized that he had made a serious mistake. He then proceeded to drink two glasses of milk followed by two short beers. Several days later, he died in a hospital under observation of the medicos who thereupon pronounced their cause of death. Deep interest has been expressed in medical and insecticide circles in the effects upon his liver, kidneys, and other vital organs which an autopsy may show. This is apparently the first recorded case where a person lived so long after such a large ingestion of DDT or oil. But what we, as well as others, are skeptical about is how the man could drink four ounces, —half an average tumbler,—without realizing that the liquid was neither whiskey nor beer.

THE Food Conservation Program now under way throughout the country aims to make more food available for human consumption by reducing the depredations of insects, fungi, and rodents. Annually these spoilers take a toll of several billion dollars worth of foodstuffs much of which is food in storage or in process. Behind this food saving program stand the Fish and Wildlife Service of the Department of the Interior, and the Department of Agriculture. Civic leaders throughout the entire country are cooperating in this work.

From the angle of the manufacturer of insecticides, disinfectants, and rodenticides, and from that of the professional pest control operator, few of whom are being overwhelmed with demand for their products or their services at present, this campaign with its high government sponsorship should be manna from heaven. The chance to secure some new much-needed business by tying in with the food campaign is too good to miss.

Already the trade associations of the industries involved have thrown the weight of their influence in behind the campaign. Many individual firms are working closely with local city and state committees. To those who have not as yet got into this thing, may we suggest that they watch their local newspapers or contact local health officials with a view to lending a helping hand. This campaign has the potentialities of adding a much-needed stimulus to the rodent and insect control business over the next six months. It could mean the difference between a good year and a poor one in 1948.



At left: The testing machine, consisting of a bar, sliding in a suitable support, to which are attached two copper bars. In turn, clamps are fixed to the ends of these copper bars and set at a 45° angle to the bars. In addition, the machine has two detachable copper tanks.

By ADRIEN DuBOIS*
Fuld Brothers, Inc.

END-USE TESTING OF

AS the title implies, this article will be limited to practical considerations on sanitary chemicals. More specifically, it will deal with the end-use evaluation of products as it is now practiced in our laboratories. Quite generally, in this industry, products are evaluated on the basis of their chemical composition. We are departing from this practice because the ultimate user is not so much interested in how much of any given ingredient is contained in a product, but in what the product will do in actual practice. The tests to be discussed here will be directly concerned with properties of cleansers, particularly "scrub soaps," namely detergency, foaming, "spendability," and wetting. These properties are among those which are of primary interest to the consumer. Insofar as tests can approximate actual practice, the results obtained provide the consumer with a more realistic picture of what he may expect from the product.

Several reasons motivated our studies. When this program was started, a little over a year ago, a survey of the literature revealed little or no reliable information on sanitary chemicals.

A second reason is the increasing tendency to evaluate sanitary chemicals from an end-use standpoint. This is quite apparent in specifications promulgated by certain Government agencies (1, 2, 3) and also in the recent literature (4).

The third reason is the neglect on the part of most producers of basic chemicals to provide specific information relative to the use of their chemicals in the sanitary specialty field.

Cleansers are the biggest single item in the sanitary chemicals industry. Whether soap or another surface-active agent is immaterial. The last few decades have witnessed a growing use of various synthetic surface-active agents claiming value as cleansers. At first, these were restricted to the textile industry. However, success in the textile markets led the manufacturers toward other outlets, such as those with which we are directly concerned. These products are offered to our industry from a background acquired exclusively in the textile industry, and little attention is paid to other fields. It is difficult to justify such an important generalization (5). The fields other than textiles are potentially lucrative, and who can say but that such a practice has not prevented the recognition of many promising and useful products as valuable cleansing agents?

The supplier of basic materials should assume the responsibility of providing the user, formulator and distributor with as complete and accurate information as possible pertaining to his needs. This is a bid for the supplier to give more attention to our specific trade, rather than giving us information pertaining to textiles. Suppliers have development facilities many times greater than have most of us in the sanitation products industry. It is logical that the supplier should shoulder a greater portion of the development work now left to the individual user. Today, people in our trade have to screen many products which the supplier should have evaluated for

* Paper before Natl. Assn o.f Insecticide & Disinfectant Mfrs., Baltimore, Md., Dec. 3, 1947.

An example of end-use laboratory methods for the practical evaluation of sanitary chemical specialties

SCRUB SOAPS

our specific purposes before attempting to sell them to us.

Information pertinent to sanitary chemicals is a necessity to any firm bent upon maintaining a high standard of quality. The specific methods to be mentioned here were evolved not in a spirit of originality, but as a necessity. These tests, for the most part, are existing tests adapted to our particular uses. There are others, but these were adopted for their obvious simplicity.

For test purposes we divided scrub soaps into four categories:

1. Neutral, alkali-absorbing
2. Neutral
3. Slightly alkaline
4. Decidedly alkaline

While it is not meant to discriminate against any one of these scrub soaps, and while particular advantages and disadvantages are recognized in each, for purposes of testing, only the first three categories are considered. The motive for this is that alkalies are claimed to be injurious to most surfaces. Whether justified or not, there is ample proof that these claims are widely believed (e.g. 6). Neglecting the safety consideration, we may eliminate alkaline cleansers from consideration by simply stating that almost any test will show them to have an apparently equivalent or higher detergency.

Our basic test for classifying these soaps is very simple. The addition of a few drops of phenolphthalein to the product immediately indicates whether it is neutral or alkaline. If it is neutral, the addition of alkalies differentiates whether it is alkali-absorbing or merely neutral. If it is alkaline, the addition of a few drops of thymolphthalein immediately differentiates whether it is only very mildly alkaline when the indicator remains colorless, or whether the product is strongly alkaline when the indicator turns blue. This last category, as stated earlier, is not considered for further tests.

AFTER determining the category to which the scrub soap belongs, its detergency is studied. The only published method found to be simple and to yield representative results, is that of Gilcreas and O'Brien (7). A modified version of their apparatus fulfills all the needs of the sanitary chemicals industry. The method may be briefly described as follows:

Machine: The machine consists of a bar, sliding in a suitable support, to which are attached two copper bars. In turn, clamps are fixed to the end of these copper bars and set at a 45° angle to the bars (copper). Further the machine has two separate, detachable copper tanks.

Soil: The following ingredients are mixed together in the molten condition:

50 g. peanut butter
25 g. butter
25 g. lard
20 g. mineral oil
20 g. xylol
Color as desired

It is best to keep this soil in the refrigerator, although it is not necessary. The contents should be mixed well before using.

Ordinary cheap microscopic slides are cleaned in soap and water. These slides should previously have been scratched at a distance of 16 mm. along the long axis, with a short line about the middle of the narrow axis. This step can be done more conveniently by immersing the slides in hydrofluoric acid to a depth of 16 mm.

The slides are dipped up to the 16 mm. mark in the soil at about 27-30° C. They are then hung on a line, by means of a clip, and the excess of soil allowed to drip off, while the soil is also drying. About ¾-1 hour is required. The slides are then ready for use. They may be kept for any amount of time until ready to use.

Test: The dry, soiled slides are inserted in the clamps, a filter paper (folded in two), being also inserted to prevent the slides from slipping out of the clip during the period of test. The two tanks are then filled to within 1-1½ inch from the top with the solution of the product to be investigated. These solutions are then brought to a temperature of 40°C. The slides are then lowered into the tanks, and the sliding bar is moved back and forth through 120 complete cycles (240 strokes), during the course of 1½-2 minutes. After that, the slides are removed from the clamps and rinsed with running cold water.

Evaluation of results: The slides, for ordinary purposes, are observed visually to determine the extent of the removal of soil. For more exact work, colorimetric or other procedures should be used to determine the percentage removal of soil (percentage detergency).

Although the test is described as using glass slides, it is not restricted to this type of surface and can be used with any other surface, such as linoleum, wood, etc. Also, the particular soil mentioned here is only one of many which have been found to be useful, particularly for glass surfaces. For other surfaces, other soils are preferable.

Of course, the use of a detergency test implies that detergency is

suitably defined. We accept the ASTM definition (8); namely, "Effectiveness of cleaning," but we further qualify it by including the ultimate use. This is made necessary by the fact that a detergent good for one use may not be as good for another use (5).

THE next property of cleansers to be considered is foam. It is well known that the importance of foam is greatly exaggerated, at least in the public opinion. However, since the ultimate user who determines the acceptance of a product asks for foam, it is not only desirable but necessary that foam be evaluated. There are many methods available to determine foam (9). However, the simplest test has also been found to be the most satisfactory. It consists of placing 1 gram of the material under test and 25 ml. tap water (Baltimore hardness 50 p.p.m.) in a tall, graduated 180 ml. cylinder, closed with a glass stopper, and shaking horizontally back and forth, for 1½ minutes. With the stopper on, the cylinder is left to stand, and the total volume in the cylinder (foam and liquid) is read immediately, and after 2.5, 5, and 15 minutes. These readings provide data on the initial foam as well as on its stability and character. The results obtained by this method are very reproducible when the conditions of the test are the same. It has given such good results that we have used it extensively to evaluate and eliminate products, which on the basis of other tests, were claimed to be excellent.

ANOTHER cleanser property to be examined is one for which in the absence of an available term, we have coined the term "spendability." This is meant to be a measure of how long a given amount of the cleanser will last under practical use; i.e., how much area it will cleanse before it is spent. Several factors participate in nullifying the effectiveness of the cleanser; e.g., neutralization by dirt, grease, etc., precipitation as alkaline earth soaps, absorption on the surface being cleaned, etc. It is felt that any test which removes the soap from solution is indicative of these combined conditions. Therefore, the test commonly used (10) to determine the hardness of water was judged to be adequate for the purpose. It consists in gradually adding to 5 ml. of a 0.1 per cent solution of calcium chloride in a 250-ml. stoppered Erlenmeyer flask, a 1:20 solution of the soap under test, shaking after each addition, until a foam lasting 15 minutes is obtained. The number of ml. of soap solution used up is the "spendability" index. The lower the index, the better is the "spendability" and the longer the cleanser lasts.

THE last test for cleansers to be considered relates to wetting power. This test indicates the ability of a cleanser to wet the surface to be cleaned, to penetrate cracks, etc. The test adopted is the very simplest one used extensively, although not officially, in the textile industry. It is similar to, though simpler than, the one adopted by a Government agency (11). It consists of dropping a 1-inch square of canvas from a height of about 10 mm. onto 150 ml. of a 5 per cent solution of the material under test (foam removed from surface) in a 200-ml. beaker and measuring the time it takes to start to sink.

Besides their usefulness in the evaluation of cleansers, the four tests discussed have proved very valuable from a special angle, namely that of assessing a value to any product in terms of cost. In the disinfectant field, it is customary to refer to disinfectants on a cost per unit phenol coefficient basis. This concept has been extended to a cost per unit foaming power, wetting power, etc. basis. This particular interpretation has led to the adoption of materials which give as high a value for a given cost as possible. However, in the over-all evaluation of a product, none of these factors can be taken individually. They must be considered in relation to the other tests with the emphasis placed upon each manufacturers' selection of a property most representative of his needs.

The tests outlined above are only a few of those which have been adopted to evaluate products from an end-use standpoint. There are many other tests for cleansers as well as for other types of products. It is believed that the above are the most illustrative, and that truly valuable benefits can be derived from their use. It is felt that in order to improve the situation in the sanitary chemicals industry, the cooperation and ideas of others must be sought. One suggestion might be for the N.A.I.D.M. to create a committee for studying from a practical standpoint, methods of evaluation and nomenclature in the field of sanitary chemicals. These studies could be used to arrive at a standardization of methods and nomenclature of particular use to this industry. It may be said that such a function is already the concern of the A.S.T.M. However, it is believed that their aim is entirely different from the ones outlined here, and that whereas they are more concerned with accurate testing, the aim of this industry is toward developing the most useful product for the consumer.

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At a concentration of about 20 per cent, carbon dioxide will kill rats and mice in cold storage rooms at 0°C. in 3-5 hours. Rodents which have been previously subjected to low temperatures for a period of time are more difficult to kill than those whose resistance has been lowered by a sudden temperature change. Preliminary tests indicate that 25-30 pounds of dry ice per 1000 cubic feet of storage capacity are sufficient to kill rodents. S. A. Pieniazek and E. P. Christopher, *Proc. Am. Soc. Hort. Sci. 48*, 93-6 (1947).

Emulsifiable Concentrates of

CHLORDANE

By Rex E. Lidov, Harvey Knous and Charles Beckwith

Julius Hyman & Company

THE inherent advantages of emulsions for a variety of insecticidal purposes, with the increased demand from the trade for this type of formulation, have made formulators acutely aware of the problems involved in their preparation. In developing formulas for chlordane emulsifiable concentrates, prime consideration has been given to keeping formulation costs to a minimum without sacrificing efficiency. Chlordane has the property of being highly soluble in paraffinic solvents. While it is recognized that for special purposes other types of solvent may be utilized advantageously, formulations presented herein employ kerosene exclusively. Light mineral oils can be substituted with little or no changes in most cases.

The use of formulations, with a specific emulsifying agent, other than those shown herein might yield final emulsions with a higher degree of stability than those shown. The formulations actually given, however, are used because they represent emulsifiable concentrates (with one exception) containing either one pound or two pounds of chlordane per quart of solution (at 60° F.).

The usual indication of chlordane content of an emulsifiable concentrate in terms of the weight per cent of the chlordane present fails to define the actual weight of the toxicant per unit volume of concentrate unless the weight per volume of the concentrate is also known. A designation of chlordane content in terms of actual weight of chlordane per unit volume of concentrate at a fixed temperature is unambiguous. Therefore, this latter type of classification is used and only those formulations containing integral pounds of chlordane per quart of emulsifiable concentrate at 60° F. are given. It should be noted that the suggestions with respect to the use of particular emulsifiers are not to be interpreted as meaning that other available emulsifiers cannot be used with equally good results.

Stability classifications are necessarily arbitrary. The particular standards here employed will be noted as the formulations are tabulated. Stability will, to some extent, be affected by the nature of water used to make up the emulsion and by the fineness of the dispersion obtained when the emulsion is made up.

The formulas contained herein are usable for the preparation of emulsions with minimum agitation. However, all emulsifiable concentrates do require reasonably thorough agitation to achieve good dispersion. It is recommended that emulsions be prepared by slowly adding the emulsion concentrate to approximately 50 per cent of the total quantity of water required, with vigorous agitation, and that the remainder of the required water then be added while agitation is continued. Alternatively, the concentrate should be well mixed with three to five times its volume of water and the concentrated emulsion so obtained added to the main bulk of the water with reasonably good mixing.

The concentrates themselves are prepared by bringing the indicated components together and mixing or stirring them until a homogeneous blend is obtained. This can usually be facilitated by application of mild heat. In no case, however, should the materials be heated above 60° C. (140° F.).

The following emulsifiers, listed alphabetically, are suggested for use in the formulations which follow:

Atlox 1045A	Atlas Powder Co., Wilmington
Atlox G-7076H	
Atlox G-1036	
D-Spers-O-Ac	Planetary Chemical Co., Creve Coeur, Mo.
Dupont IN-2503	E. I. du Pont de Nemours & Co., Wilmington
Emulphor ELA	General Dyestuff Corp., Chicago
Emulside-413 B	Van Dyk & Co., Belleville, N. J.
Emulside-420 B	
Emulside-480 B	
Emulside-620 B	
Emulside-680 B	
Glycox 1300	Glyco Products Co., Brooklyn
Igepal No. 300	General Dyestuff Corp., Chicago
Mulsor 461	Synthetic Chemicals, Inc., Paterson, N. J.
Sterox SK	Monsanto Chemical Co., St. Louis
Sterox SE	
Trex 40	Griffin Chem. Co., San Francisco
Trex 60	
Trex 80	
Triton X-45	Rohm & Haas Co., Philadelphia
Triton X-155	
Triton B-1956	

Highly Stable Emulsions

SPACE limitations prevent special consideration of individual formulations which have been developed. These formulations are presented in tabular form. Table I gives formulations for concentrates producing highly stable emulsions. (See next page.)

Emulsions (2% chlordane) prepared from formulas 1 (a) and 1 (b), immediately after preparation will range in appearance from creamy liquids to opalescent colloidal solutions. These emulsions, in most cases,

are highly stable, showing either no cream layer or, at most, a negligible one. In the latter case, redispersion is accomplished with little agitation. Emulsions will withstand low temperature but not actual freezing.

As the emulsifiable concentrates age, a change in their characteristics occurs. As a result, dispersion of the blends in water at two per cent chlordane concentration yield, in most cases, not emulsions or colloidal solutions but what appear to be true solutions. Tests indicate that the insecticidal potency of the chlordane thus bound is not adversely affected.

Emulsions containing 0.125 per cent to 2.0 per cent chlordane prepared by using formulations 2 (a) or 2 (b) possess a very high degree of stability. No attempt is made to indicate the actual amount of kerosene to be employed as this will vary with the specific gravity of the emulsifying agent and the kerosene. It is critically important in emulsions of this type that the specific gravity of emulsifiable concentrate be adjusted precisely to equal the specific gravity of the water. By varying the amount of emulsifying agent some degree of variation in the stability of final emulsion can be obtained. Variations in the amount of emulsifying agent used in this type of emulsion should remain within the range from 0.1 to 0.525 pounds per pound of chlordane.

Contrary to what might be expected of emulsions which depend on equal specific gravity of oil and water phases, in the majority of cases such emulsions display marked stability despite changing temperatures. Some emulsions thus prepared (balanced for specific gravity at 80° F.) have proved stable for periods of at least a month at temperatures of 38° F.

Moderately Stable Emulsions

NO sharp line of demarcation can be drawn between emulsions of different stabilities. In general, the emulsions mentioned previously, have stabilities such that separation times can be measured in weeks or months.

The emulsifiable concentrates in table II are those in which emulsions containing two per cent chlordane (wt/wt) will show not over two per cent by volume of cream layer after 24 hours. It should be emphasized that emulsions with chlordane contents down to 0.125 per cent (wt/wt) (dilutions of 1 to 800) are, in general, as stable as those containing two per cent wt/wt of chlordane.

Formulae 3 (a) and 3 (b) produce milky white emulsions of at least the indicated stability. The cream layer, when it does appear, is readily redispersed by gentle agitation. Formulae 4 and 5 tend to produce emulsions of borderline stability. The resulting emulsions containing two per cent wt/wt of chlordane will show approximately two per cent cream layer after standing for 24 hours. These concentrates readily produce typical milky emulsions which, on creaming, redisperse readily.

TABLE I—Emulsifying Agents

		Name	*Amounts*	*Kerosene*	*Chlordane Content*
1 (a)	50% (wt)	Trex 60	50% (wt)	—	50%
1 (b)	50% (wt)	Trex 80	50% (wt)	—	50%
2 (a)	1 lb.	Atlox 1045A	0.25 lb.	*	app. 40% (wt)
2 (b)	1 lb.	Trex 40	0.25 lb.	*	app. 40% (wt)

* Kerosene sufficient to make specific gravity of emulsion concentrate equal to that of water employed.

TABLE II—Emulsifying Agents

	Chlordane	*Name*	*Amounts*	*Kerosene*	*Chlordane Content*
3 (a)	2 lbs.	Trex 60	0.428 lbs. (6⅞ oz.	*	2 lbs. per qt.
3 (b)	2 lbs.	Trex 60	0.285 lbs. (4⅝ oz.)	*	2 lbs. per qt.
	2 lbs.	Trex 80	0.143 lbs. (2 5/16 oz.)	*	2 lbs. per qt.
4	1 lb.	Triton X-45	0.104 lbs.	*	1 lb . per qt.
	1 lb.	Triton X-155	0.104 lbs.	*	1 lb . per qt.
5	1 lb.	Atlox 1045A	0.312 lbs. (5 oz.)	*	1 lb . per qt.

* Kerosene sufficient to make one quart of emulsion concentrate.

Lower Stability Emulsions

AS previously indicated, no sharp line of division is possible in determining the stability classification of emulsions. In general, the chlordane concentrates in this classification produce emulsions (two per cent chlordane-wt/wt) which on standing for 24 hours in a graduated cylinder, show cream lines exceeding two per cent of the total emulsion volume. However, variations which occur from batch to batch in the emulsifiable concentrate and in the water employed may throw some of the emulsions into the moderately stable class or change their positions within this class. A large number of formulations are available for concentrates of this type. No attempt will be made to discuss each of them. Instead, the formulation of each is given in Tables III and IV and data is presented to indicate the creaming rate of emulsions containing two per cent wt/wt chlordane prepared from each formulation.

The great majority of the concentrates listed readily produce typical milky emulsions which, on creaming, can easily be redispersed with gentle or moderate agitation. On longer standing, however, (48 to 72 hours) some of them may actually show breaking (separation of an oil phase). They then fail to be redispersed easily.

Use of the table can be illustrated by reference to formulation 7b. Table III indicates that the emulsifying agent (B) present is 20 per cent by weight. The table tells further that kerosene (E) to the extent of 10 per cent by weight is used. In addition, Table III shows that an emulsion containing two per cent (wt/vol.) chlordane prepared by using emulsifiable concentrate 7b deposits a 2.5 per cent (by volume) cream layer at the end of one hour, and that this cream layer increases to three per cent at the end of three hours.

Similarly, from Table IV it is learned that formulation II contains

two emulsifying agents "Triton X-45" (a) and "Triton X-155" (c); that the first of these is present to the extent of 0.156 lb. (B) and the second of 0.052 lb. (D).

In general, it should again be noted, the emulsifiable concentrates herein presented can be used to produce emulsions in which the percentage (wt/wt) of chlordane can be varied from two per cent (1 to 50 dilution) to 0.125 per cent (1 to 800 dilution). Almost all of the emulsions prepared from a given concentrate within this range are equally stable for practical purposes. Incidentally, the range of dilutions indicated should not be taken as defining the limits within which these concentrates can be used: more exactly it defines the dilutions actually studied in the laboratory.

It should be noted that four of the emulsion concentrates (notes c, d, e, f) strictly speaking, do not properly belong in the present category inasmuch as their emulsions actually break, instead of cream, and because they then redisperse with more difficulty than the other members of the group.

It is in emulsions of this last category (moderate to low stability) that changes in concentration of emulsifying agent produce the most pronounced effects. In general, increasing the indicated amount of emulsifying agent will lead to a more stable emulsion but this must not be taken as an invariable rule. However, decreasing the amount of emulsifying agent below that given in the tables will almost always decrease the stability of the resulting emulsion. Hence, the formulator has at his command the ability, when it seems desirable to do so, to produce formulations designed to make quick breaking emulsions. The judicious selection of a formulation from the group listed, and adjustment of the formula selected, will make it possible for the formulator to produce a concentrate yielding an emulsion of almost any desired degree of stability.

The emulsifying agents listed here have, where tested, appeared to be satisfactory from the point of view of phytotoxicity.

Table III—Moderate to Low Stability Emulsions

Form. No.	*Emulsifying Agent*	*Percent By Wt. Emulsifying Agent*	*Percent Kerosene by Weight*	*2% wt/vol chlordane Emulsion Vol. % Cream layer at:*			
	(A)	*(B)*	*(E)*	*1 hr.*	*3 hrs.*	*8 hrs.*	*24 hrs.*
7 (a)	Trex 60	30	0	trace	1.5	2	4
7 (b)	Trex 60	20	10	2.5	3	3	3
7 (c)	Trex 80	15	15	4	4.5	5	5.5

Chlordane ..... 70% by wt.
A-Emulsifying agent ..... "B%" by wt. *(see Table 1)
Kerosene ..... "E%" by wt. *(see Table 1)

Chlordane ..... 1.0 lbs.
A-Emulsifying Agent ..... B lbs.*
C-Emulsifying Agent ..... D lbs.*
Kerosene to make ..... 1 quart

Chlordane Content: One pound technical chlordane per quart of concentrate.

Table IV—Moderate to Low Stability Emulsions

Form. No.	*First Emulsifying Agent*	*Wt. (Lbs.)*	*Second Emulsifying Agent*	*Wt. (Lbs.)*	*2% wt./vol. chlordane Emulsion Vol. % Cream layer at:*				
	A	*B*	*C*	*D*	*1 hr.*	*3 hrs.*	*8 hrs.*	*24 hrs.*	*Notes*
8	Trex 80	0.208	0	0	2	3	3.5	3.5	
9	Atlox G-1036	0.208	0	0	4	4.5	5	5	
10	Atlox G-7076H	0.208	0	0	3.5	5	6	6	
11	Triton X-45	0.156	Triton X-155	0.052	tr.	tr.	tr.	6	
12	Sterox SK	0.208	0	0	tr.	1	3	6	a.
13	Emulphor ELA	0.208	0	0	4	6	6	6	
14	Atlox 1045A	0.104	Sterox S.K	0.104	1	2	5	6	
15	Triton X-155	0.208	0	0	4.5	6	6	6	
16	Triton B-1956	0.208	0	0	5.5	6	6	6	
17	Triton X-45	0.104	D. Triton B-1956	0.104	6	6	6	6	b.
18	Igepal No. 300	0.208	0	0	6.5	7	7	7	
19	Mulsor 461	0.208	0	0	6	6.5	6.5	6.5	
20	Triton X-45	0.052	Triton X-155	0.156	1.5	3		8	c.
21	Emulside-480B	0.208	0	0	2	4	6	8	
22	Emulside-680B	0.208	0	0	2.5	5	6.5	8	
23	Trex 40	0.208	0	0.	3	4.5	7.5	8.5	
24	Sterox SE	0.208	0	0	3	7.5	8	8.5	
25	Atlox 1045A	0.208	0	0	4	8	8	8.5	
26	Triton X-45	0.208	0	0	6	7	8	9	d.
27	Emulside 413B	0.208	0	0	5	7.5	8	9	
28	Emulside 420B	0.208	0	0	4.5	7	8	9	
29	Glycox 1300	0.208	0	0	4	7	8	9	
30	Emulside 620B	0.208	0	0	7	8.5	9	10	
31	Trex 60	0.208	0	0	8	9	9	10.5	e.
32	IN-2503	0.208	0	0	9	10.5	12	12	f.

a. Emulsion breaks almost completely after 72 hrs. Does not pick up readily after 72 hrs.
b. Three phases form on standing. Does not redisperse readily.
c. Three phases form on standing.
d. Oil separates out on standing beyond twenty-four hours. Does not redisperse readily.
e. Redisperses only with vigorous shaking after twenty-four hours.
f. Does not pick up readily after twenty-four hours.

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EXPERIMENTAL SAMPLES ON REQUEST

Practical Aspects of

DISINFECTION

Field Tests indicate present-day disinfectants lack penetration. Their efficiency impaired by organic matter, dirt, pH, neutralizing agents and particularly by incompetence of operators

By W. L. Mallmann*
Michigan State College

MUCH of the difficulty in the practical application of most disinfectants lies in their improper application or the evaluation of their usefulness through the improper information obtained by laboratory technics. This is no indictment against the various techniques of evaluating disinfectants in the laboratory for comparative purposes, but rather a candid discussion of practical applications and their relationship to laboratory techniques.

The most important property of a disinfectant, accepting the fact that the compound has the property of killing bacteria as demonstrated by the phenol coefficient, is penetration. This characteristic is largely forgotten in most of the laboratory techniques of evaluation; however, it is very important, particularly when attempts are made to apply disinfectants to substrates where bacteria are intimately intermingled with inorganic and organic soil. Many methods of measuring penetration have been devised since Chick tried agar cylinders and fecal material, up to present methods such as the agar cup procedure. At present, there are no good routine laboratory procedures that yield satisfactory results.

Few disinfectants have the property of penetrating organic or inorganic soil to destroy imbedded organisms. In 1895, Vincent (1) demonstrated that disinfectants, such as phenol and the heavy metal salts were of little value in destroying bacteria imbedded in human fecal matter.

Penetration Studied

IN 1933 Mallmann and Chandler (2) made a study of disinfectants, to determine penetrability. Their experiments were made as follows: Chicken feces were finely ground in a mortar and strained through cheese cloth to remove all large lumps. The resulting suspension was a finely divided particulate mass of syrupy consistency. In each test tube was placed 0.05 ml of this material and 10 ml of the disinfectant under study, giving a ratio of one part of fecal matter to 200 parts of the disinfectant. The tubes were stoppered with flamed corks and then were shaken constantly during the period of exposure. Exposures of 10 and 30 minutes were made. At the end of each period the tubes were centrifuged for one minute to precipitate the fecal matter. The disinfectant was decanted and an equal amount of sterile distilled water was added, thoroughly shaken and again centrifuged. This process was repeated from two to five times to remove all bacteriostatic traces of the disinfectant on the bacteria so that bacteria in the fecal matter when planted into nutrient agar would not be inhibited. Iodine and chlorine compounds were neutralized by the addition of sodium thiosulfate. Results obtained with some of the disinfectants employed in that study are presented in Table 1. An examination of this table reveals that 1-500 mercuric chloride, 5 per cent tincture of iodine, 2 per cent formalin, 1 per cent creolin and chlorinated lime (1 lb. to 4 gal. of water) failed to sterilize the fecal matter. The surviving bacteria were largely non-spore forming types. Coliforms were isolated in most cases. Only a 0.4 per cent colloidal iodine solution gave sterilization.

TABLE 1

Penetrability of various disinfectants measured by bacterial kill in avian fecal matter

	Time of exposure in minutes	
Disinfectant	10	30
Colloidal iodine 0.4%	0	0
Mercuric chloride 1-500	212,000	91,000
Tincture of iodine 5%	105,000	7,000
Formalin 2%	91,000	553,000
Creoline 1%	301,000	777,000
Chlorinated lime (1 lb. to 4 gal.)	855,000	2,283,000

In 1943, Anderson and Mallmann (3) made a study of penetration by disinfectants. Avian coccidial oocysts were selected as test organisms because the heavy coccidial wall protects the organism against adverse condition far more effectively than even the walls of bacterial spores. Freshly collected washed coccidial oocysts were

* Before Natl. Assn. Insecticide & Disinfectant Mfrs., Baltimore, December 4, 1947.

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used. The coccidia were suspended in the disinfectant solutions and at various intervals of time portions were removed to determine viability. The disinfectant was either neutralized or the suspensions of coccidia were centrifuged and washed repeatedly with sterile saline solution to remove the residual disinfectant. The coccidia were then held at room temperature and checked for sporulation. Some of the results from Table 8 and 9 of this report are presented in Table 2. It will be observed that 1-20 tincture of iodine, 1-1000 tincture of merthiolate, 1-1000 aqueous merthiolate, 650 p.p.m. available chlorine (H.T.H.) and 1-1000 azochloramide failed to destroy an appreciable number of the coccidia. A 1-20 colloidal iodine solution gave 100 per cent kill in 4 hours exposure. To show the comparative penetrability of tincture of iodine and colloidal iodine, the experiment was repeated with 1-20 solutions at both shorter and longer intervals of exposure. At the end of 10 minutes the colloidal iodine killed 100 per cent of coccidia, whereas the tincture of iodine failed to kill after an exposure of 24 hours.

These data are reviewed at this time not necessarily to show the value of colloidal iodine but rather to show the lack of penetrability of some well known disinfectants in current use.

TABLE 2

Rates of penetration of disinfectants measured by percentage kill of coccidia

Compound	*Concentration*	*Percentage-kill of coccidia in four hour exposure*
Tincture of iodine	1-20	4
Colloidal iodine	1-20	100
Tincture Merthiolate	1-1000	0
Aqueous Merthiolate	1-1000	6
H.T.H.	650 p.p.m.	0
Azochloramid	1-1000	1

		Percentage kill of coccidia exposure	
		10 minutes	*24 hours*
Tincture of iodine	1-20	0	0
Colloidal iodine	1-20	100	100

In 1947, Johns (4) presented a technique for measuring efficiency of quaternary ammonium and hypochlorite products. This method consists of dipping the lower half of a microscope slide into a suspension of *Micrococcus candidus* in sterile skim milk. After the milk films were partially dried, the slides were dipped into various concentrations of quaternary ammonium and hypochlorite solutions for periods of 1, 5, 10 and 20 seconds. The slides were rinsed momentarily in tap water, then they were placed in Petri dishes and nutrient agar was poured into them. Colony counts were recorded. The results show that, even after 20 seconds exposure, 200 p.p.m. of both quaternary ammonium or hypochlorite compounds failed to yield sterility. This was due to the fact that neither of these compounds could penetrate the milk film and destroy the imbedded bacteria.

A practical demonstration of the lack of penetrability was made by Mallmann and Churchill (5) in 1946. The worst possible conditions were selected for the test. One wall of a frankfurter storage and packing room was continuously wet from condensation of moisture. The wall was heavily contaminated with molds and bacteria. Both painted and unpainted surfaces were tested. The walls were washed with trisodium phosphate, rinsed with water and then swabbed with a 1-1000 solution of an alkyl dimethyl benzyl ammonium chloride. The results are presented in Table 3. The unpainted concrete surface population dropped from 28,000,000 per two-inch square to 380,000 by washing with trisodium phosphate. Rinsing with water reduced the count to 53,000. Swabbing with a cationic sanitizer gave a count of 100. In marked contrast, were the results obtained by swabbing the same wall with the disinfectant without previously cleaning the surface. Here the reduction was from 28,000,000 down to 11,000,000.

All these data from various publications have been cited to show that disinfectants now on the market lack the property of penetration. These data are not presented to show the failure of disinfectants but to show that, in practical application, disinfection of unclean surfaces has only limited value. The data show definitely that disinfectants should be used to destroy bacteria left on surfaces only after proper cleaning has been used. Most of the bacteria should be removed mechanically by good detergents and

TABLE 3

Action of quaternary ammonium compound on contaminated concrete wall

Treatment	*No. of bacteria per 2 in. square*
Painted surface	260,000
Unpainted surface	28,000,000
Followed by:	
Washed with trisodium phosphate	
Painted surface	250,000
Unpainted surface	380,000
Followed by:	
Rinsed with water	
Painted surface	26,000
Unpainted surface	53,000
Followed by:	
Swabbed with 1-1000 cationic disinfectant	
Painted surface	0
Unpainted surface	100
Without previous cleaning	
Swabbed with 1-1000 cationic disinfectant	
Unpainted surface	11,000,000

TABLE 4

Influence of blood serum on germicidal activity of three disinfectants

	Minimum killing dilution		
Per cent serum	*Quaternary Ammonium chloride*	*2-chloro 4-phenyl phenol*	*Ortho phenyl phenol*
0	22,000	13,500	2,400
1		9,000	
2	16,000		
3		7,500	2,200
4	9,200		
5		6,000	2,100
6	7,400		
7.5		4,500	2,000
8	5,800		
9			
10	5,200	4,000	1,900

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TABLE 5

Rate of kill of Staphylococcus aureus

Compound	*Concentration*	*Exposure in minutes*	*Initial seeding*	*Surviving organisms*
Iodine	1-1,000,000	2	80,000,000	0
	1-100,000	0.5	70,000,000	0
Merthiolate	1-10,000	20	70,000,000	17,500,000
	1-5,000	15	67,000,000	3,000,000
Brilliant green	1-20,000	30	50,000,000	50,000,000
	1-10,000	20	11,000,000	2,500,000

flushing with an abundance of water. The disinfectant should be used only as a precautionary safety measure.

Effect of Organic Matter

A SECOND factor which must be considered in practical disinfection is the influence of organic matter on the activity of the disinfectant. To obtain data on the influence of organic matter it is necessary to mix organic matter with the disinfectant and then add the test organisms. In this manner, of testing, the organic matter will not surround the organisms and serve as a protective coating. If the organic matter reacts with the disinfectant, the germicidal activity will be reduced accordingly. Mallmann (6) in 1944 presented a report on the effect of blood serum on the activity of three disinfectants, namely, alkyl dimethyl ammonium chloride, 2 chloro 4 phenyl phenol and ortho phenyl phenol. Serum concentrations of 0 to 10 per cent were tested. The results are presented in Table 4. These data show that all three disinfectants are reduced in activity by the presence of organic matter, although those with high minimum killing dilutions are affected to a greater extent. All disinfectants are reduced in activity by the presence of organic matter, however those with low phenol coefficient are less affected.

The presence of neutralizing agents on the surfaces to be disinfected also affects the germicidal activity of disinfectants, for example, quaternary ammonium compounds are neutralized by soaps and anionic wetting agents.

The pH of the surface or a menstruum to be disinfected also affects the activity of the compound. Mallmann (6) cites two examples. A quaternary ammonium compound 1-1000, was checked at pH values of 5, 7 and 9 after one minute exposure. The results follow:

pH value of solution	*Per cent kill*
5	55.6
7	96.2
9	100.

With this disinfectant the germicidal value decreased markedly with a fall in pH. Wolf (7) determined the minimum killing dilution of 2 chloro 4 phenyl phenol. The results follow:

pH value of solution	*Mim. killing dilution*
5.9	1-13,000
6.1	1-14,000
6.2	1-15,000

The significance of interfering substances such as organic matter, neutralizing agents, OH and H ions on the activity of a disinfectant is well demonstrated by the data presented. Similar results have been found by other research workers.

It is evident that the presence of soil on the surface to be disinfected will materially reduce the activity of the disinfectant. It should be remembered however, that in the case of natural soil, either on surfaces or in liquids, the bacteria are generally imbedded in the soil so that even though the disinfectant were unaffected by organic matter, the bacteria would not be killed due to the lack of penetrability on the part of the disinfectant. Again from the standpoint of practical disinfection, the need of a clean surface is clearly demonstrated.

TABLE 6

Action of alkyl dimethyl benzyl ammonium chloride at 70° F.

Test organisms	*Dilution*	*Number of surviving bacteria per ml after 10 seconds exposure*
Staph. aureus	1-10,000	0
	1-15,000	0
	1-20,000	0
	Control	27,000,000
M. caseolyticus	1-10,000	0
	1-15,000	0
	1-20,000	0
	Control	460,000
E. coli	1-10,000	0
	1-15,000	120,000
	1-20,000	36,000,000
	Control	91,000,000

Speed of Reaction

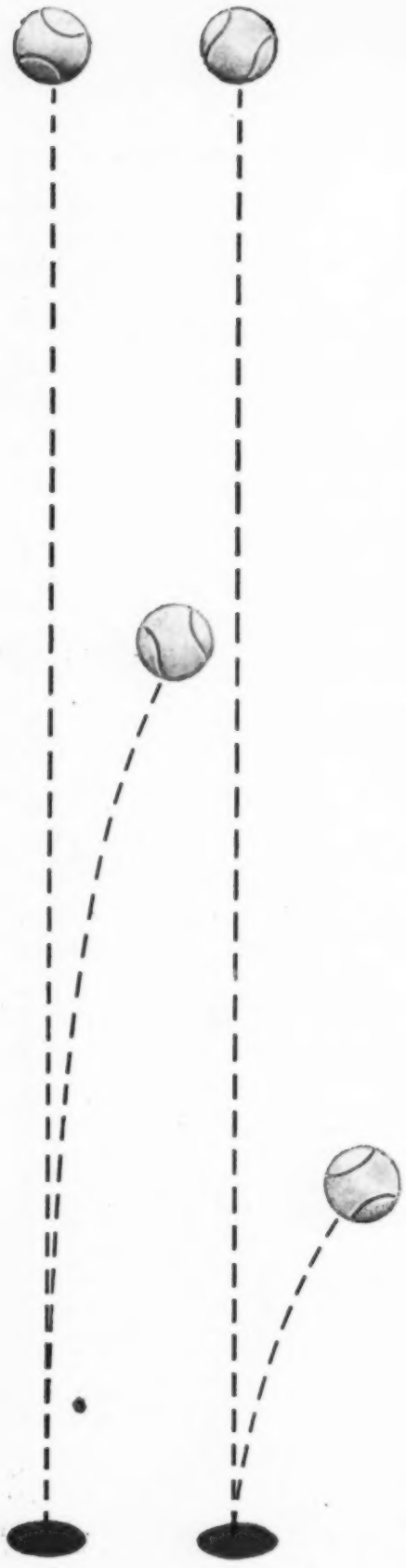
A THIRD factor which must be considered in practical disinfection is the speed of reaction of the disinfectant. Disinfectants vary widely in their rate of kill. Anderson and Mallmann (3) show killing rates on three compounds. The results are presented in Table 5. These data show a marked difference in reaction time for these three compounds. Mallmann, Kivela and Turney (8) and Mallmann and Zaikowski (9) show the rapid killing action of quaternary ammonium compounds. Table 6 presents data from this report. These data show that this compound has a high rate of kill. Similar data could be presented for sodium hypochlorite. If speed of reaction is necessary for a certain practical application, then certainly the compound selected for the job should have this characteristic.

These factors have been presented together with the accompanying data to show the effect of each as a limiting factor in the application of disinfectants under practical use. These factors have been reviewed to bring to your attention the multiplicity of problems in practical disinfection and to call to mind the fact that no laboratory test exists at the present time that actually measures the practicality of a disinfectant. Many tests, such as those using organic matter in the disinfectant solution or the dipping of a slide covered with a mixture of organisms and organic matter are not measurements of practical application, but instead are merely laboratory tests demonstrating some of the limiting factors in practical disinfection.

Field Tests

THE writer has stressed throughout the paper that disinfectants should be applied to a clean surface and if organic or inorganic soil is present, unsatisfactory results may be obtained. The writer is fully cognizant of the fact that in practice, surfaces are not always fully cleaned. Because surfaces are not always physically clean and because laboratory tests never evaluate

(*Turn to Page 165*)



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The Newer Insecticides *against* ROACHES

By
George E. Gould
Purdue University

NEW insecticides introduced over the course of the past few years have been so numerous that entomologists and consumers alike have had difficulty in keeping pace with the latest developments. The success of DDT, since its release to the general public in 1945, has been outstanding and more recently many new materials have been made available, at least to research workers. Each of these materials has to be tested against a wide variety of insects and under a number of different conditions before it can be safely recommended for general use. During the past three years many chemicals have been tested in our laboratory against the German roach to determine, first, efficiency as compared with known insecticides and second, efficiency specifically against the German roach.

The methods of rearing the German roach and of testing the effectiveness of various materials have been described in previous papers (1, 2 and 3) and have been continued with minor changes. Since no testing is done during summer, the roach colony is destroyed each spring except for about 250 females and 160 males which are divided among 12 gallon-size, glass battery jars. A dry, commercial dog food in pellet form and water are supplied at all times. From this start in May the colony contains about 2,000 adult roaches and several thousand immature forms in August when the jars are emptied into an open-topped cage with a screen wire bottom. This cage sets into a wooden box that is four inches longer and wider. Both the inner and the outer cages are lined with vaseline-covered celluloid to prevent the escape of roaches. Both pulverized dog food and water are supplied to the roaches in self-feeders.

As the young roaches hatch from the eggs, they can go through the screen wire into the wooden cage below. Once a week the young roaches are removed from the lower cage by a suck-bottle and placed in a battery jar. About the middle of October the first of the roaches will start maturing in the oldest colonies. In our tests mature males and females were used within 48 hours after maturity. Tests with roaches two, five and 10 days after maturity indicated that the older individuals were somewhat more difficult to kill, but not enough so as to justify the separation of the sexes at maturity and holding them 10 days. In mixed colonies many females were carrying egg capsules in 10 days.

The technique used in the testing of chemicals consisted in blowing the material up in the double-walled settling chamber and allowing the dust to settle for eight minutes on the floor of a wooden tray. The roaches were then dumped into the tray and could run through the dust film for a period of eight minutes. Five roaches of one sex were used per test and usually three lots, or 15 roaches, were in the tray at one time. At the end of the exposure period five roaches of one sex were placed in a clean glass jar and were kept under observation until death or at most 96 hours. As a rule 10 tests on each sex were made with each mixture. The complete series was never run on one day, but on three or more days scattered over a month or more.

Results of the tests with two insecticides made in 1944-45 are given in Table 1. DDT showed considerable variation in effectiveness between mix-

TABLE 1. The percentage of kill and the average survival time of German roaches treated by the dust settling chamber method with mixtures of DDT and of azobenzene. October, 1944 to April, 1945.

Insecticides and diluents	*Percent active ingredients*	*MALES* Percent kill	*MALES* Survival time	*FEMALES* Percent kill	*FEMALES* Survival time
DDT (Geigy Gesarol A20)	20	100	29.7	98	68.8
(Geigy Neocid A10)	10	100	33.9	76	76.5
(Geigy Gesarol 40%) — pyrophyllite	5	100	34.3	68	70.9
(Geigy Gesarol A3)	3	100	36.6	84	56.6
(DuPont 10%)	10	100	17.1	100	41.3
(DuPont 10%)—pyrophyllite	5	100	21.7	100	46.1
(DuPont 10%)—marc 50%	5	100	14.2	100	35.2
(DuPont 10%)—marc 50%—pyrophyll.	3	100	20.4	90	45.1
Geigy GNB-A 100%—pyrophyll.	10	100	33.3	86	83.9
GNB-A—pyrophyllite	5	100	32.6	90	76.4
GNB-A—dextrine	5	100	45.5	55	81.6
GNB-A—walnut shell flour	5	84	55.6	40	82.5
GNB-A—Cellulose filler	5	82	71.6	34	80.5
GNB-A—starch	5	100	45.0	54	82.5
GNB-A—Georgia talc	5	100	47.4	56	77.5
GNB-A—Frianite	5	100	49.8	86	73.7
GNB-A—Schlunder clay	5	100	41.7	78	63.9
Azobenzene 20% dust (Sher.-Williams)	20	100	17.3	99	30.6
Above plus pyrophyllite	10	100	28.3	98	40.6
Above plus pyrophyllite	5	68	67.4	25	75.5
Above plus marc 25%	15	100	9.6	100	16.6
Above plus marc 50%	10	100	11.3	100	18.9
Above plus marc 75%	5	98	21.4	60	26.3
Above plus marc 50% (exposed to air for 11 days)	10	100	28.5	20	48.0
Above (sealed 12 days)	10	100	10.3	100	22.7
Above (sealed 62 days)	10	100	16.3	75	25.2

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tures with different diluents and with different sources of the insecticide. For the purpose of comparison it was better to consider the results against the female roach, as this sex has proved to be in all tests the more difficult to kill. Five formulations of DDT from one company showed considerable variation in effectiveness and in no case killed all females. A 10 per cent dust from another company used alone or diluted to 5 per cent strength with either pyrophyllite or marc killed all females. When a 100 per cent DDT powder was diluted with various diluents to make a 5 per cent mixture, pyrophyllite was found to be the best diluent, followed by Frianite and clay, while a cellulose filler, talc, starch, dextrine and walnut shell flour were inferior.

A second material given extensive tests was a commercial mixture containing 20 per cent azobenzene. Used at this strength or diluted with pyrophyllite to 10 per cent, the kill of females was practically 100 per cent, while at 5 per cent the kill dropped to 25 per cent. At the 15 and 10 per cent levels, with pyrethrum marc as a diluent, the kills were increased to 100 per cent and the speed of action accelerated. When exposed to air the azobenzene-marc mixture lost most of its effectiveness in 11 days, while the same mixture kept in a sealed container for 12 and 62 days still showed excellent killing power.

TESTS made in 1945-46 are given in Table 2. In this series several new insecticides were used alone and with pyrethrum marc. DDT again showed considerable variation in effectiveness with the best results from the use of a micronized sample. A chlorinated camphene, *Toxaphene*, at a 5 per cent strength and a benzene hexachloride mixture with an 0.5 per cent gamma isomer content both killed all female roaches. Marc apparently had no activating effect upon these materials.

Chlordane, gave a good kill at a 2 per cent strength, but was not activated appreciably by the addition of marc. Of the two dicyanimide compounds from the American Cyanamid Company the calcium dicyanimide dust was better than the zinc compound. However the latter material showed a marked increase in effectiveness when marc was added to the mixture. The new rat poison, 1080 or sodium fluoroacetate, gave a 90 per cent kill of the female at a 1 per cent dilution, but would not make a practical roach powder because of its acute toxicity to higher animals. The two standard roach insecticides, sodium fluoride and sodium silicofluoride, were included for comparison. A 10 per cent dust made from a finely-ground sodium fluoride killed 48 per cent of the roaches and was as effective as a 25 per cent sodium silicofluoride dust. The addition of marc to the fluoride gave an improvement in the speed of kill and some increase in the percentage of kill. A 10 per cent sabadilla dust killed 75 per cent of the females, but the addition of marc, boric acid or sulfur decreased the efficiency of the 10 per cent dust.

TABLE 2. The percentage of kill and the average survival time of German roaches treated by the dust settling chamber method with various insecticide mixtures. Diluent in most mixtures pyrophyllite plus pyrethrum marc D where indicated. October, 1945 to April, 1946.

Insecticide	*Percent active ingredients*	*MALES* Percent kill	*MALES* Survival time	*FEMALES* Percent kill	*FEMALES* Survival time
Pyrethrum marc D (Powell) *	—	0	—	0	—
DDT (Geigy A5) *	5.0	100	35.5	53	75.5
DDT (Geigy A10) *	10.0	100	30.7	87	73.3
DDT (Baker technical)	10.0	100	30.6	93	67.4
DDT (Rohm & Haas micronized)	10.0	100	28.5	99	63.7
DDT-impreg. pyrethrins*	8½	88	44.8	71	65.4
Impregnated pyrethrins*	0.5	70	51.8	34	63.6
Chlorinated camphene (No. 3956C	10.0	100	15.0	100	22.3
or Toxaphene)	5.0	100	24.3	100	40.1
Benzene hexachloride (Hooker)	1.0	100	33.3	100	55.3
BHC plus 75% marc	1.0	100	28.0	100	52.4
Benzene hexachloride (Merck)	1.0	100	31.1	100	47.8
Benzene hexachloride (Merck)	0.5	100	38.3	100	65.9
BHC plus 50% marc	0.5	100	27.7	98	62.1
Benzene hexachloride (DuPont)	1.0	66	52.8	20	70.0
Chlordane	2.0	100	40.6	98	68.8
Chlordane	1.0	100	52.8	82	84.5
Chlordane plus 50% marc	1.0	100	54.7	46	80.0
Zinc dicyanimide (Amer. Cyan.)	25.0	87	74.4	46	80.0
Zinc dicyanimide plus 75% marc	25.0	100	12.6	100	20.9
Zinc dicyanimide	10.0	84	78.6	38	89.0
Zinc dicyanimide plus 75% marc	10.0	100	32.0	93	48.7
Calcium dicyanimide (Amer. Cyan.)	50.0	100	8.4	100	11.3
Calcium dicyanimide (Amer. Cyan.)	25.0	100	7.3	100	21.7
Calcium dicyanimide (Amer. Cyan.)	10.0	100	33.7	89	52.8
Calcium dicyanimide plus 75% marc	25.0	100	10.7	98	30.8
Calcium dicyanimide plus 75% marc	10.0	93	33.8	77	48.8
Sabadilla (McConnon)	10.0	98	28.7	75	52.2
Sabadilla (McConnon)	50.0	100	11.8	100	22.7
Sabadilla plus 50% marc	10.0	100	33.9	57	54.8
Sabadilla plus 50% boric acid	10.0	100	64.0	40	73.7
Sabadilla plus 50% sulfur	10.0	76	45.0	12	—
Sodium fluosilicate (Planters)	25.0	100	45.6	49	77.0
Sodium fluoride N (General mic.)	10.0	92	34.6	48	63.5
Above plus 90% marc	10.0	100	15.1	58	39.5
Sodium fluoroacetate	1.0	100	19.7	90	42.5

* Diluent not known.

IN tests during the winter of 1946-47 several new insecticides were tried at a series of dilutions in order to determine an approximate M. L. D. factor. The first sample of benzene hexachloride (labeled No. 1 in Table 3) was a 50 per cent wettable powder with a gamma content of 5.75 per cent from the Niagara Sprayer and Chemical Company. At a dilution of 0.2 per cent gamma it killed 92 per cent of the females. Sample No. 2 made from a 10 per cent gamma dust from the Pennsylvania Salt Manufacturing Company killed 42 per cent of the females with a 0.2 per cent dust. Sample No. 3 was a purified gamma of benzene hexachloride from Niagara (ME 21) and killed no females at the 0.2 per cent gamma dilution. The benzene hexachloride dust concentrates from Pennsylvania Salt listed under No. 4 as A, B and C contained 5 per cent of the gamma each. A was made

(*Turn to Page* 177)

INSECTICIDAL Surface Coatings

By S. S. Block*
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University of Florida

Part II

In part I of his paper, Dr. Block outlined a test procedure for determining toxic properties of insecticidal surface coatings. He continues his discussion by comparing the effectiveness of some insecticides in various vehicles.

IN VIEW of the effectiveness of DDT in urea-formaldehyde it was of interest to compare the effectiveness of some other insecticides. Table V presents comparative toxicity data for several insecticides in three vehicles. DDT and gamma benzene hexachloride were the only non-volatile insecticides showing very rapid knockdown. Although DDT in urea-formaldehyde was noted to give faster knockdown than gamma hexachloride, as shown in Fig. 2, the latter brought faster kill, while the flies knocked down by DDT often buzzed around unable to stand for relatively long periods following recording of the knockdown time. As shown, chlordane was more effective in nitrocellulose than in urea-formaldehyde, suggesting, therefore, a more complete study of the effectiveness of each insecticide in different types of vehicles. On the other hand, the superiority of DDT and gamma benzene hexachloride is undoubtedly the result of the susceptibility of the insect used in these tests to these insecticides. Pyrethrum was shown to be too volatile, even when incorporated with resin, to be effective for a practical period of time. Chlordane has the special quality of being a liquid and not forming crystals in clear finishes like the other insecticides (Fig. 4-6), thus not affecting the appearance.

Against cockroaches, gamma benzene hexachloride proved to be greatly superior to the insecticides in Table VI. Chlordane gave faster knockdown than DDT, while "Toxaphene" and DDD did not appear to be at all effective when used in this manner. One minute contact tests gave negative results with all the insecticides. The roaches in contact with the gamma benzene hexachloride coating for one minute showed nervous effects, but recovered and were not knocked down in 48 hours.

Suggested Uses

THE effectiveness of the insecticides in different coating vehicles suggests their use in insecticidal specialty products. For example the high toxicity of DDT in asphalt varnish suggests the use of this material as a

TABLE V

The Comparative Effectiveness on Houseflies of Several Insecticides in Surface Coating. 20% Insecticide Based Upon Dry Weight of Coating.

Insecticide	*Time for 50 Percent Knockdown (minutes) Initial Test*	*After Specified Interval*	*Interval Between Tests (weeks)*
Vehicle: Urea-Formaldehyde			
DDT	16	10	28
gamma Benzene Hexachloride	13	16	6
Chlordane	60	41	7
Toxaphene	48	35	12
DDD	28	25	17
Pyrethrum	18	2, 11, 23, 52	8, 14, 15, 17 days
Vehicle: Nitrocellulose			
DDT	60	17	35
gamma Benzene Hexachloride	39	20	30
Chlordane	76	28	30
Toxaphene	55	26	12
Vehicle: Polymerized Diolefins			
DDT	21	32	6
gamma Benzene Hexachloride	20	23	6
Chlordane	71	29	30

1. Dichloro-diphenyl-trichloroethane
2. Hexachlorocyclohexane
3. Octachloro-methano-tetrahydroindan
4. Chlorinated Camphene
5. Dichloro-diphenyl-dichloroethane

TABLE VI

The Comparative Effectiveness on American Cockroaches of Several Insecticides in Urea-Formaldehyde Surface Coatings. 50% Insecticide Based on Dry Weight of Coating.

Insecticide	*Time for 50 Percent Knockdown (hours)*	*Time for 100 Percent Knockdown (hours)*
DDT	24	48
gamma Benzene Hexachloride	1	1.5
Chlordane	15	18
Toxaphene	>48	—
DDD	>48	—

* Before Natl. Assoc. Insecticide and Disinfectant Mfrs. December 2, 1947, Baltimore, Md.

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March — *Newsworthy Items for Technologists and Production Men* — 1948

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On this page we have covered seven Onyx products, each of which should be of specific interest to many industries not only for indicated applications but for potential uses which will be suggested to the reader by the properties outlined. If you think that one or all of these products might help you improve any of your own products or operations, or if you see a promise of interesting new products or operations which may be possible through the use of any of these Onyx materials, please feel free to ask for samples. Just let us know just what use you plan to make of them, in order that we can be sure to send an adequate sample and cooperate with you in furnishing whatever information we have that bears on the use or uses you have in mind.

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Improving solutions for washing of fruits and vegetables through added dispersing and penetrating action plus faster, more thorough rinsing.

Providing better spreading and dispersing effects in insecticides and fungicides.

Conditioning paper mill felts, for breaking in new felts and reconditioning loaded felts. (Used here in solution without other materials.)

It is quite possible that the properties indicated above will suggest other possible uses for NSAE Powder in one or more operations in your plant – or in one or more of the products you manufacture. We are anxious not only to discuss these possible uses with you, but to send an adequate sample for tests in your plant, or in the field to determine whether or not NSAE Powder will prove profitable or useful to you. Please feel free to call on Onyx for samples as well as consultation on possible applications. Onyx Technical Bulletin IND.-2 covers this product in detail. Ask for as many copies as you can use.

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•

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base for a paint for window screening. This would provide protection of the screening and insecticidal action at the same time. It would be particularly useful on screen doors, for it has been observed by the author that many mosquitoes gain entrance to the home by resting on the screen doors and flying in when the doors are opened. When mosquitoes are in contact with an effective DDT coating they become affected in a very short time—long before they are knocked down—and attempt to escape. Thus they would not linger on a treated surface. For plastic screening, the insecticide might be incorporated directly into the plastic as indicated by the effectiveness of DDT in resin polymers such as "Vinylite" and "Polyamide." Migration of the DDT, as demonstrated, would tend to keep a deposit of insecticide on the surface of the wires.

For inexpensive water paints or whitewash for farm buildings and dairies, formulations of paints employing casein, glue, or cement would be advisable. One to five per cent of DDT in a chalky coating could be expected to give control of flies. Lime whitewashes are not very effective because of chemical reaction between lime and DDT, inactivating the latter.

More expensive coatings, but more satisfactory from the standpoint of insecticidal effectiveness as well as paint properties can be based on resin coatings. Urea-formaldehyde resin has been demonstrated to possess excellent properties as a DDT vehicle. A solution of 10 per cent resin and 10 per cent DDT can be painted or sprayed onto a white wall without materially affecting the appearance of the wall. On darker surfaces the crystals of DDT are visible. This type of coating can be applied to walls, baseboards, garbage receptacles, doors, screens, closets and other places around the house to protect against mosquitoes, flies, ants and moths. A similar coating with gamma hexachloride as the toxicant would lend itself to combatting roaches in places where it would not be desirable to use an insecticidal dust. Protection of wood from termites, impregnation of sacks to check grain insects, and treatment of service clothing to control body lice are some other promising uses for such resin-insecticide formulations.

It has been shown that urea-formaldehyde-DDT coatings, employing certain plasticizers to prevent brittleness, retain their insecticidal properties. Further work is indicated in the formulation of such paints in which other resins are incorporated to improve the paint qualities, without reducing the insecticidal properties. The extensive use of formaldehyde resins in wet strength paper suggests the production of paper containers and wrappers which have not only wet strength, but insecticidal properties as well. The water soluble urea-formaldehyde resin employed with an emulsion concentrate of DDT or other insecticide may serve as a base for insecticidal water paints that give water resistant coatings.

Other formulations for specialty uses will suggest themselves to the reader. Insect-proof adhesives, insecticidal furniture waxes and vermin-proof book covers are a few further examples of the type of products that the formulator may develop by building on the data given here.

Summary

1. Data have been presented to demonstrate the insecticidal effectiveness of DDT in different surface coating vehicles. Among these vehicles, urea-formaldehyde resin and asphalt varnish with DDT were outstanding in yielding rapid knockdown times with houseflies. Both coatings with 20 per cent DDT knocked down 50 per cent of the flies in less than 10 minutes.

2. The effect on the insecticidal qualities of several DDT coatings of adding an inert pigment in the formulation was studied. The addition of sufficient pigment markedly increased the insecticidal properties of oil films and water paints. Urea-formaldehyde and nitrocellulose coatings were not improved in effectiveness with 60 per cent by weight of pigment.

3. Urea-formaldehyde coatings with as little as 5 per cent DDT gave total knockdown in less than one hour when the flies had been in contact with the coating surface for one minute. In 10 seconds contact with a coating containing 20 per cent DDT, half of the flies were knocked down within 40 minutes and all were knocked down within 150 minutes.

4. Dimethyl phthalate and castor oil employed as plasticizers for urea-formaldehyde resin, were found to have little effect on the toxicity of the coating. DDT, itself, was noted to have plasticizing properties.

5. Tests with several other insecticides in surface coatings indicated that DDT and gamma benzene hexachloride were the only insecticides giving very rapid residual knockdown with flies. Tested against adult American cockroaches, gamma benzene hexachloride in urea-formaldehyde gave 100 per cent knockdown after 1½ hours contact, chlordane after 18 hours and DDT after 48 hours. "Toxaphene" and DDD coatings evidenced no toxicity toward roaches in 48 hours.

6. Use of insecticidal coatings in new specialty products was discussed and several types were suggested.

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Concerning Quaternaries....

Additional data support "semi-micro" technique in testing quaternary germicides. Bacto-Oxgall suppresses bacteriostasis by cationic compounds

By Emil G. Klarmann and Eleanore S. Wright Lehn & Fink Products Corp.

IN A recent paper "On the Germicidial Behavior of a Quaternary Ammonium Compound," J. W. Klimek and L. E. Umbreit (1) report certain observations said to be in disagreement with those made previously by E. G. Klarmann and E. S. Wright (2, 3). Since Klimek and Umbreit did their work with one cationic compound only, viz., benzalkonium chloride and based their conclusions upon the results of this work, we shall refer here at first, for reasons of a better comparison of the two reports under discussion, to our work with one of the four cationic compounds studied by us, viz., the Quaternary Ammonium Compound "A."

This is not the place for an historical review of the methodological problems which arose when the cationic compounds began to be subjected to bacteriological evaluation by the testing method in current use, viz., the original F.D.A. phenol coefficient technic. Those who have been participating in the activities and deliberations of the Disinfectant Scientific Committee of the N.A.I.D.M. for the past several years will recall the long discussions dealing with the difficulties encountered in the bacteriological assays of cationic compounds. It should be mentioned in passing that it is because of the discrepancies and inconsistencies in the test results obtained with cationics by the F.D.A. method, that a cooperative project was undertaken under the leadership of L. S. Stuart who rendered a progress report at the June, 1947, meeting of the N.A.I.D.M. upon the results obtained with a modification of the F.D.A. method as applied to a cationic test compound by 11 collaborating laboratories (4). Even with the modification designed to reduce the tendency to variations in the critical 10 minute killing concentrations of the cationic tested, considerable fluctuations from laboratory to laboratory were encountered. All this is a matter of published record; while it is entirely possible that some particular cationic compound may yield more consistent results than other cationics, and more so in the hands of one bacteriologist than in those of another, it is still true that, as a class, these compounds possess certain common peculiarities which warrant continued research upon testing methods which would take care of these peculiarities, both from the point of view of the practical performance of the cationics, and from that of a fair comparison with disinfectants belonging to other classes.

Results With "Semi-micro"

IN discussing the variations contingent upon the volume of sample transferred from the medication mixture to the subculture tube, Klimek and Umbreit appear to imply that Klarmann and Wright evolved their "semi-micro" technic chiefly to increase the size of the sample cultured, and they offer evidence to show that increasing the volume of the sample does not materially affect the results. While we feel that the amount of medication mixture cultured is of some importance, we never claimed that it is of primary importance in testing cationics. This idea has been brought out in our papers. "We were not satisfied that the decrease in the size of the transfer was the sole determining factor"; we postulated that "the regular F.D.A. technic is inapplicable to the testing of quaternary ammonium compounds, one of the reasons being that the 4 mm. loop employed in making transfers does not carry a representative sample of the disinfectant-bacteria mixture." Since, therefore, the sample did not properly represent the whole, we were led to the logical requirement of ascertaining the condition of the *entire* medication mixture at the end of the contact period, rather than that of any unrepresentative sample thereof. Reference to Table II in our first paper (2) will show that in the case of the quaternary ammonium compound A (10%) by subculturing the entire 5.5 cc of the medication mixture in 200 cc of broth (in an exploratory test), we arrived at a minimum killing concentration (in 10 minutes) for *Eb. typhosa* of 1:300 (phenol coefficient 4.2) as against a concentration of 1:1500 (phenol coefficient 18.5) by the regular F.D.A. procedure. (The manufacturer's label indicates the even higher phenol coefficient of 25, by claiming one of 250 for the "anhydrous" product). By our "semi-micro" technic, quaternary ammonium compound A (10%) gave the phenol coefficient of 4.2 (i.e., the same figure as by the procedure described above; however, when the medication mixture (0.55 cc) was diluted with 40 cc instead of with 20 cc the phenol coefficient dropped still further, viz., to 2.8. Evidently the dilution with 20 cc of broth was not sufficient to stop the inhibitory action of the quaternary am-

monium compound A. As shown in our second paper (3) this result was not affected further by the use of serum broth as diluent.

Klimek and Umbreit, while conceding the soundness of the rationale of the "semi-micro" procedure, say that they cannot confirm its merits on the conclusions reached by its use. Since there was no contact between the respective laboratories to throw some light upon the reason for this disagreement, it is impossible to say why Klimek and Umbreit did not obtain the same results as were reported by Klarmann and Wright. Klimek and Umbreit, however, did not follow all our procedures in every detail. Apparently they did not attempt to duplicate our "semi-micro" tests with serum broth described therein (used to suppress bacteriostasis). Had they studied this phase of the work they might have found experimental support for the rationale of the "semi-micro" technic.

Surface Cumulation of Bacteria

IN an endeavor to account for the observed fact that a 4 mm. loop did not carry a representative sample of the medication (disinfectant-bacteria) mixture, we formulated the hypothesis that in the presence of a cationic compound the viable bacterial cells were not uniformly distributed in the liquid, but that there was a tendency to cumulation against the walls of the vessel which interfered with the removal of an average sample by means of a loop. The experiments carried out in support of this hypothesis were not intended to serve as the basis of a quantitative testing technic for quaternary ammonium compounds. The details of the original experimental procedure will be found in our first paper (2). Briefly, we believe we have shown that approximately the same volume of liquid (0.05 cc), when removed from the medication mixture by means of a glass strip carries a greater number of bacteria than when removed with a pipette; no such difference is seen when, e.g., phenol is present in the medication mixture. This phenomenon was observed first with *Pseudomonas aeruginosa*, and subsequently with *Eb. typhosa* and *Staph. aureus*.

Klimek and Umbreit state that using benzalkonium chloride they did not succeed in producing this phenomenon. Again we are unable to say where the trouble lies. No attempt has been reported by these authors to duplicate the highly relevant experiments with *Ps. aeruginosa*. However, the phenomenon of massing of bacterial cells against glass surfaces was mentioned by other investigators in the recent past. It supplies the reason for the recommendation of a "swab method" made by Cade (5) which is found to parallel in efficiency the "semi-micro" technic of Klarmann and Wright. It was observed by Eckfeldt and James (6) under certain conditions which, incidentally, gave rise to the ingenious hypothesis that adsorption of the cationic substance by the glass reduced its bacteriostatic concentration in the immediate proximity of the glass below the inhibitory range, thus causing the *Staph. aureus* colonies to develop adjacent to the glass. In another experiment, Eckfeldt and James showed that a bacteriostatic concentration in agar of a cationic compound nevertheless permitted the development of colonies of *Staph. aureus* if the agar was spread upon a glass surface in a very thin layer.

However, with specific reference to the findings of Eckfeldt and James, we feel that theirs is only one, albeit an intriguing theory of this phenomenon, for the reason that this effect can be produced under conditions where bacteriostasis appears to be completely suppressed from the start, i.e., without an opportunity for the development of a concentration gradient by adsorption of the cationic substance upon the glass surface. Although we have shown previously that bacteriostasis by quaternary ammonium compounds can be controlled to a considerable extent by means of serum, we have found more recently that "Bacto-Oxgall" in the subculture is even more effective in this respect, while offering at the same time certain conveniences in the course of the testing procedure which had to be dispensed with when working with serum as antidote for bacteriostatic action. We expect to render a separate report upon the use of Bacto-Oxgall in connection with our "semi-micro" technic of testing cationics. In the present communication we are referring to its use in connection with experiments relating to the massing of bacteria against glass surfaces in the presence of quaternary ammonium compounds. The composition of the subculture medium and its method of preparation follow:

Water	1000 cc.
Armour's Peptone	10 gms.
Armour's Beef Extract	5 gms.

Use 50 grams of Bacto-Oxgall if the medium is to be used for *Staph. aureus*, and 10 grams, if for *Eb. typhosa*. Adjust to pH 7.2-7.4 and autoclave in bulk for one-half hour. Add 10 grams of "Super-Cel" per liter to 5 per cent oxgall broth, and 5 grams to 1 per cent oxgall broth and filter while hot. Add 5 grams of dextrose per liter, tube and autoclave for one-half hour at 15 pounds pressure. (For the preparation of agar plates, add 15 grams of agar after filtration and adjust the pH if necessary.) In 1 per cent oxgall broth, a culture of *Eb. typhosa* will grow in the presence of 0.25% (i.e. 1:400) of the quaternary ammonium compound "A." In 5 per cent oxgall broth, *Staph. aureus* will grow in the presence of 0.05 per cent (i.e. 1:2000) of the quaternary A. In actual use, the bacteriostatic ranges of the media are never even approached. For purposes of comparison it should be pointed out that in plain F.D.A. broth the bacteriostatic concentration of the quaternary ammonium compound "A" is 1:100,000 for *Eb. typhosa*, and 1:1,000,000 for *Staph. aureus*.

For reasons of illustration we are giving below our findings with the quaternary ammonium compound "A" when tested by the "semi-micro" method with Bacto-Oxgall in the subculture. The several steps of the procedure are the same as described elsewhere (3) except that the 1 per cent oxgall medium is used to subculture *Eb. typhosa*, and 5 per cent oxgall medium is used for the same purpose with *Staph. aureus*. For the benefit of those who may wish to use this method, a detailed description follows:

Cotton plugged pyrex tubes,

25x150 mm. are sterilized by dry heat. A series of tubes is placed in a water bath at 20°C., and 0.05 cc of a 24 hour F.D.A. broth culture added to each tube. Care must be taken to place the culture directly in the bottom of the tube without touching the sides of the tubes. At 30 second intervals, 0.5 cc of diluted disinfectant is added to each tube and the tube shaken and returned to the bath. At the end of a ten minute period 20 cc of oxgall broth is poured into each medication tube on the 30 second interval. The oxgall broth has previously been tubed, 20 cc. per tube, so that no delay in measuring is encountered. All tubes are incubated at 37°C. for 48 hours. Growth may be identified by Gram stain if necessary.

Table I lists the results of six tests carried out by the above method with the quaternary ammonium compound "A." The minimum germicidal concentrations are expressed in terms of dilutions derived from the 10 per cent concentrate as available in commerce.

It will be seen that "wild plusses" and "skips" still occur, but from a series of tests one can form a fairly definite conclusion as to bactericidal activity. The 1:100 dilution would be accepted as the true germicidal dilution from which to calculate a use dilution which according to the formula "20 times the phenol coefficient" would be 1:25 (or 4 per cent). This is, of course, a much higher concentration than the 1:500 use-dilution derived from the phenol coefficient of 25 claimed on the label of this disinfectant. (The greatest amount of quaternary ammonium compound present in the subculture medium is 0.0033 per cent or 1:30,000.)

Oxgall agar as subculture medium was used in experiments intended to demonstrate the cumulation of bacteria on glass surfaces as induced by certain dilutions of quaternary ammonium compounds. Dilutions of the cationics which correspond to those appearing to be bactericidal by the F.D.A. technic, were used for these tests. The procedure employed is as follows:

Glass strips 10x38 mm. were sterilized in 25x150 mm. pyrex tubes. The tubes were placed in a water bath at 20°C. Then 1.5 cc. of a 24 hour broth culture was added, care being taken not to touch the walls of the tube above the glass strip by the inoculating pipette. Just before adding the disinfectant, the tube was tipped so that the glass strip was thoroughly infected on both sides. Now 15 cc. of diluted disinfectant was added and the tube agitated. The tube was not shaken again at any time. At the end of 10 minutes 0.05 cc. was pipetted from the medication mixture and placed in 20 cc. of the oxgall agar which had been cooled to 45°C. This was plated. Then the glass strip was withdrawn and plated in the same manner. (The glass strip carries approximately 0.05 cc. of the liquid.) All plates were incubated in an inverted position for 48 hours at 37°C. The results are given in Table II.

As can be seen, the trend of the readings is quite consistent although the individual results are irregular.

Representative tests are given for other disinfectants for the sake of comparison (Table III).

For some reason as yet unexplained one cannot obtain growth in agar from solutions as concentrated as those that produce growth in broth.

TABLE I

Disinfectant		*Eb. typhosa*						*Staph. aureus*					
Test No.		1	2	3	4	5	6	1	2	3	4	5	6
Quat. Amm. A													
10%	1:80						+			—	—	—	
	1:100	—	—		—	—	—	—	—	+	+	—	+
	1:200	+	—	+	+	—	+	—	+	+	+	—	+
	1:300	+	+	—	—	+	+	+	+	+	+	+	+
	1:400	+	+	+	+	+	+	+	+	+	+	+	+
	1:500	+	+	+	+	+							
Phenol													
	1:50							—	—	—	+	—	—
	1:60							+	+	—	+	—	+
	1:70							+	+	+	+	+	+
	1:80	—	—	—	—	+	—						
	1:90	—	+	+	+	—	—						
	1:100	+	+	+	+	+	+						

TABLE II

		Eb. typhosa				*Staph. aureus*					
		0.05 cc.		*Slide*		0.05 cc.			*Slide*		
Test No.		1	2	1	2	1	2	3	1	2	3
Quat. Amm. A											
10%	1:1000	0	0	1	†	0	0	2	0	281	144
	1:2000	2	0	0	†	0	0	0	0	31	145
	1:3000					0	0		1	441	
	1:4000	0	11	†	253	1	3	0	254	5000	24
	1:6000	0	162	†	1449			33			197
Phenol											
	1:60					0			0		
	1:80					0	0		0	0	
	1:90	0	0	0	0						
	1:100	3	4	0	2	354	693		400	630	
	1:110	11	40	21	60						
	1:120	441	701	945	680	‡					

† Indicates growth around the edge of the slide.
‡ Indicates innumerable colonies covering the plate.

Concluding Remarks

KLIMEK and Umbreit consider an additional number of factors which in their opinion might play a role in affecting the variable results obtained with benzalkonium chloride. A detailed discussion of these factors would go far beyond the scope of the present communication which attempts to hold the problem down to its essentials. At this point we wish to state merely that we are not attributing any great significance to such things as, e.g., the variation in the sensitivity of the test culture. We do not believe that the latter factor would furnish even a partial explanation for the substantial difference in the results obtained respectively by the original F.D.A. and the "semi-micro" technics.

(*Turn to Page* 167)

TECHNICAL Briefs

From Current Literature in the Sanitary Products Field

Deodorizing BHC

Improvement in the odor of crude benzene hexachloride used for pest control compositions is obtained by agitating with silica gel. The benzene hexachloride is ground with a dust insoluble in water and the resulting powder is agitated with coarse, hard silica gel for about a day, and then separated by sieving. The silica gel can be regenerated by steam distillation or extraction. J. J. Gray and Imperial Chemical Industries Ltd. British Patent No. 586,464; through *Chem. Abs.*

◆

Tyrothricin is Fungicidal

The antibiotic, tyrothricin, obtained from Bacillus brevis, has fungicidal properties at high dilutions against a number of fungi. Growth of *Sclertinia fructicola, Trichloderma* species, *Aspergillus awamori,* and *Penicillium* species, was inhibited completely by a solution containing 16 parts per million of tyrothricin. L. Gershenfeld and S. B. Averbach, *Am. J. Pharm. 119,* 315-21 (1947).

◆

DDT Production Notes

Crude DDT melts around 90°C. Silky, glossy needles recrystallized from alcohol with an average yield of 70 per cent, melt at 105-6° C., but with a second recrystallization melt at 108°C.

Experiments to simplify and cheapen the production of material with a high DDT content which would be easily emulsifiable with water, showed very satisfactory results with a solution of 20 per cent DDT in an ammonium soap prepared from cottonseed oil. One part of this mixture in 10 parts of water furnishes an emulsion very suitable for washing domestic animals. O. R. Gottlieb and T. de Morais. *Rev. quim. ind. 15,* No. 173, 21-3, 345-7; through *Chem. Abs.*

◆

Rodenticidal Activity

Red squill approaches the ideal rat poison in that it is relatively safe and is effective when properly distributed. However, as a crude plant product, it is subject to inherent disadvantages.

Thirty-two different chemical compounds of various types were tested toxicologically to determine whether they possessed the properties desired for the synthesis of rodenticides. DDT fed in olive oil was the most toxic of these compounds to rats. Furfuramide when fed in adequate concentrations was sufficiently toxic to warrant further investigation.

Eleven organic compounds of the DDT type were prepared and tested as rodenticides. Of these, only trichloromethyl (thiazyl-amino (2)-)-methanol appears to merit further investigation. J. W. Nelson, L. D. Edwards, J. E. Christian, and G. L. Jenkins, *J. Am. Pharm. Assoc., Sci. Ed. 36,* 349-52 (1947).

◆

Microbial Growth on Soap

Examination of an unusual microbial growth on soap showed the presence of *Micrococcus saponophilus, Penicillium crustosum, P. flavidorsum,* and a species of *Cladosporium.* Since the first organism was of an unusual character, it was provisionally given the name mentioned. Evidently growth of mold was favored by the high moisture content of the soap, which was 18.7 per cent. The bar contained 35.7 per cent of total fats, and was strongly alkaline. The organisms therefor possessed tolerance to strong alkali and some ability to attack fats. O. Verona, *Ann. facolta agrar.* Pisa 6, 1-7; through Chem. Abs.

◆

Synergist Studies

Synergists were used mixed with pyrethrins, and as a preliminary treatment on flies, followed by spraying with pyrethrins in kerosene. A mixture of piperonyl cyclohexenone derivatives with pyrethrins is somewhat less effective than when the two are used in sequence. Mixtures of sesame oil concentrate with pyrethrins, and of *N*-isobutyl undecylenamide with pyrethrins were effective whether used as mixtures or in sequence. A. W. Lindquist, A. H. Madden, and H. G. Wilson, *J. Econ. Entomol. 40,* 426-7 (1947).

◆

Disinfecting Instruments

Although sterilization of medical, surgical, and dental instruments in an autoclave under the proper conditions of temperature and pressure is still the most reliable method for complete sterilization, the use of cold disinfectant solutions is in rather general use for some applications, as in sterilizing sharp instruments whose temper might be injured by heat. While no disinfecting solution has been developed that meets all of the desired requisites, several are in practical use and offer the advantages of simplicity of equipment required, avoidance of heat effects, and freedom from corrosion.

The chief limitation of these solutions is their inefficiency in killing bacterial spores. Even those combinations which are relatively effective required quite prolonged action in order to kill these resistant bacterial forms. Thorough precleaning of instruments is very important. According to one authoritative source if cold disinfection is to be used, at least four steps are required: (1) Thorough mechanical cleansing of the instruments to remove all blood, pus, and other foreign material which might harbor

bacteria, (2) prolonged soaking in the disinfecting solution, (3) rinsing with water, and (4) drying under sterile conditions. Agitation, forced circulation or other mechanical aids are generally required when disinfecting solutions are used to treat instruments with hinges, crevices, or canals. Water should be forced through hypodermic needles to clean them and the disinfecting solution should be drawn through the needle while it is still attached to the syringe.

Soap and water are usually employed for cleaning instruments prior to placing them in the disinfecting solution. For very heavily contaminated instruments, the following cleaner may be used:

	Parts
Prepared chalk	20
Ammonia	20
Alcohol	20
Water	40

The instruments are rubbed with a cloth saturated with this mixture and then wiped with a dry cloth.

Alcohol is among the liquids employed, as shown in the following formula for disinfecting dental handpieces:

	Parts
Liniment of soft soap, U.S.P.	5
Water	10
Alcohol	35

The detached instrument is immersed for 15 minutes, then removed and wiped dry. Isopropyl alcohol is rapidly replacing ethyl alcohol for disinfecting purposes. There is evidence that isopropyl alcohol possesses about twice the germicidal strength of ethyl alcohol. It is most active in the original concentration as purchased, although a 50 per cent solution has been reported germicidal against non-sporulating bacteria.

Alcohol should not be counted on to kill spores on surgical instruments. Cresols are effective against all of the non-sporulating pathogens when used in the proper concentrations. An effective solution based on cresol consists of two per cent of compound cresol solution and five per cent of glycerine in a mixture of equal parts of alcohol and water.

Formaldehyde solutions have proved quite successful. In proper concentrations, formaldehyde is an effective germicide against all forms of organisms. In a concentration of 1:200 it kills both spore-forming and non-spore-forming anaerobic bacteria in 6-12 hours. One of the major advantages of formaldehyde solutions is that they retain much of their effectiveness in the presence of organic matter. The disadvantage of formaldehyde is that it is not only a primary skin irritant but is also a skin sensitizer. Hence contact of the skin with such a solution must be avoided. The following solution, developed by Tainter and his associates, has been used successfully:

Isopropyl alcohol	1000 cc.
Oil of rose geranium	2 cc.
Oil of cinnamon or cassia	4 cc.
Distilled water	780 cc.
Sodium nitrite	4 grams
Mono- or triethanolamine	60 cc.
Solution of formaldehyde U.S.P.	160 cc.

The ingredients are mixed in the order given. Immersion of 10-15 minutes killed common pyrogenic bacteria, and immersion for five hours killed the most resistant spores tested. Instruments were not corroded by continuous use of the solution.

The quaternary ammonium compounds such as "Ceepryn," "Zephiran chloride," "Onyxan," "Roccal," etc. are good bactericides. Their potency is reduced in the presence of serum and blood, and lost in the presence of soap. They are also said to have little sporicidal activity. The concentration used is generally 1:1,000 for the disinfection of instruments and rubber articles, preferably combined with 0.5 per cent of sodium nitrite to minimize corrosion. M. A. Lesser, *Drug and Cosmetic Ind. 60*, 180-2, 268-71 (1947).

Mothproofing Furs

Furs are mothproofed by immersing in highly saline aqueous solutions of formaldehyde with a pH no higher than 2.5, for 7-48 hours. D. Traill and A. McLean, to Imperial Chem. Industries Ltd. U. S. Patent No. 2,424,068.

Controlling Aerosol Conc.

The chief requirements of a method of air disinfection are convenience and cheapness, and in meeting these needs the aerosol technique can claim to have made good progress. The presence of such antiseptics as propylene glycol or resorcinol causes a considerable kill of mixed bacteria in a short space of time. The concentration of aerosol in the air can easily be controlled, since the generators, which are electrically operated, can be switched on and off at will, and being easily portable, they can be used where required. With the assistance of a Bourdillon slit sampler, adequate comparative tests can be readily carried out.

The formula used to calculate concentrations, and time and output necessary to achieve them, is given as:

$$x = KV\left(\frac{1}{CW - KVN}\right)$$

where x equals time in hours, W equals output of liquid in cc. per hour, V equals volume of room to be treated in cubic feet, C equals parts of air per part of aerosol, N equals air changes per hour, and K equals 28,300. A generator recently introduced to the British market by Aerosols Ltd. is described. *Manufacturing Chemist 18*, 507-8 (1947).

Fatty Acid Fungicides

The fungistatic and fungicidal action of fatty acids from formic acid to hendecanoic acid on various strains of trichophyton increased with the increase in the length of carbon chain and decreased with an increase in pH. E. Grunberg, *Yale J. Biol. Med. 19*, 855-76 (1947).

Test with Rodenticides

City block tests in Baltimore on populations of brown rats with ANTU, fortified red squill, and zinc phosphide, showed that combination baits containing 3 per cent of ANTU gave up to 93 per cent reduction in rat populations. Fortified red squill and zinc phosphide gave only 12-26 per cent reduction. J. T. Emlen, Jr., and A. W. Stokes, *Am. J. Hyg. 45*, 254-7 (1947).

DISINFECTING . . .

(*From Page 145*)

all obstacles to practical use, it is obvious that only field tests will yield the necessary information. Two types of field tests are indicated, namely (1) tests made under supervision where proper cleaning was used prior to the application of the sanitizer (the supervised field test) and (2) tests made without supervision where uncontrolled factors, as personnel, proper cleansing, etc. may enter into the final results (the unsupervised field test). The supervised field test shows the effectiveness of the sanitizer under practical conditions where ideal operation exists. The unsupervised field test will show how the compound will be used under actual conditions which must be encountered in general use.

Mallmann, Kivela and Turney (8) made a study of beverage glass sanitation where the operations were supervised. All glasses were washed in a good detergent with brushing, rinsed in clean water and dipped into a sanitizing solution. Every tenth glass was tested bacteriologically. Data from this study are presented in Table 7. An examination of the data shows that both the hypochlorites and the quaternary ammonium compounds gave excellent results. However, when we place these same compounds in the hands of 25 beverage establishment operators, we will find a number of these places obtaining very unsatisfactory results, even though they maintain proper concentrations of the sanitizer in the rinse tank, and even though they actually dip each glass in the sanitizer. The answer in part is improper cleaning. The percentage of places with satisfactory results will depend largely upon the training of the operators. Poor results are not the fault of the sanitizer but the incompetence of the operator to use the compound correctly.

An unsupervised study on sanitizing milking machines was made by Mallmann, Kivela, Bortree, Churchill and Begeman (10). In this study 10 producers were used for each method of sanitizing. In each group were placed three good, three bad, and four average producers. Each producer started with a clean machine and full instructions were given each individual. The milk from each producer was tested weekly. All samples were taken at the receiving station. The data, arranged by grouping the producers into good, bad and intermediate categories, are presented in Table 8. An examination of the data shows that good milk was produced by the good producers with all three sanitizing procedures. All these farmers washed their machines properly so that the sanitizer had a fair chance of doing the job it was designed to do. All the poor producers, irrespective of the sanitizer used, had unsatisfactory bacterial counts. This was due largely to improper washing but was also due, in part, to improper use of the sanitizer. The intermediate group obtained better results with the cationic sanitizer. This was due, in part, to the fact that these compounds are more effective on improperly washed surfaces but also because the farmer is more apt to use the compound because it has no odor.

TABLE 7

Comparative study of glass sanitizers under practical conditions

Glass No.	Bacteria per unit: Control	Hypochlorite 170 p.p.m.	Chloramine T 200 p.p.m.	Quaternary ammonium compound 150 p.p.m.
50	1,700	0	260	0
100	10,000	0	530	0
150	4,800	0	670	0
200	1,200	10	450	0
250	2,900	0	510	0
300	1,500	0	1,500	0
350	2,400	0	430	0
400	1,700	110	610	0
450	1,500	0	260	0
500	600	30	670	0
550	2,300	0	760	0
600	4,900	0	910	0
650	1,900	0	570	0
700	2,900	0	1,400	0

These practical unsupervised tests showed that a cationic sanitizer could be used successfully for the sanitization of milking machines. The fact that some of the farmers, using either chlorine or cationics, did a very unsatisfactory job, does not condemn the sanitizers but does demonstrate that many farmers must be educated in the proper use of detergents and sanitizers.

It is conceivable that a product may work very satisfactorily in a supervised field test and still be unsatisfactory when tested in an unsupervised field test due to dislike of the product by personnel or to other factors of interference such as improper cleaning or improper application to the utensils. If a compound gives unsatisfactory results in a supervised field test, there would be no need of an unsupervised field test because, obviously, if it fails to work under ideal operation, it would certainly not work where poor operation existed.

The writer suggests these two procedures of evaluating practical sanitization because he has found both of these methods successful means of determining the value of sanitizers and because he has been unable to evaluate practical application through laboratory techniques such as the phenol coefficient, in the absence and presence of

TABLE 8

Comparative total counts of various methods of sanitizing milking machines

Method of sanitizing	*Average Bacterial Count* — *Best three producers*: *No. of Samples*	*Count*	*Poorest producers*: *No. of Samples*	*Count*	*Intermediate producers*: *No. of Samples*	*Count*
Rubbers stored in hypochlorite — pre-rinsed with hypochlorite	103	60,000	98	393,000	110	94,000
Rubbers stored in alkali. Pre-rinsed with hypochlorite	77	18,000	102	236,000	133	140,000
Rubbers stored in cationic disinfectant. Pre-rinsed with same	92	19,000	133	159,000	142	142,000

organic matter, agar cup method, minimum killing dilutions, and calculated use-dilutions based on 20 times the phenol coefficient.

The writer does not offer any criticism of laboratory procedures, attempting to measure total kill or 99.9 per cent kill, as far as regulatory procedures are concerned. It is necessary to have such techniques for regulatory control, but such regulatory procedures should not be used for evaluating the possible practical application of a sanitizer or disinfectant.

Does the product do a satisfactory job in the field? Does it eliminate health hazards? Can it be used to lessen microbial contamination? If the end results are satisfactory, the product should be approved, irrespective of whether its phenol coefficient is 5 or 250, whether it is affected by organic matter in high or low dilutions or other factors which may not be particularly important in actual field use.

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QUATERNARIES

(*From Page 159*)

Under the heading "Discussion" Klimek and Umbreit refer to the F.D.A. phenol coefficient procedure as being "fallacious" in that it does not distinguish between inactivity and a substantial reduction of the bacterial count. In regard to this matter, we have indicated on several occasions that we are not concerned with the merits or demerits of an "end method" of which the F.D.A. procedure is but one specific version. Our point of departure is the *existence* of the F.D.A. procedure and its use by a federal regulatory agency. We are fully aware that certain dilutions of various disinfectants (including phenol and phenolic compounds) which are "non-germicidal" under the experimental conditions of the F.D.A. method are capable nevertheless of reducing the bacterial count by 99 per cent or better (viz. with almost any number of digits following the decimal point). However, as long as a method is used which requires a 100 per cent kill, and the potency of the disinfectant upon the label is expressed in terms of quantitative data obtained by such a method, it does not appear fair to claim exception for one class of disinfectants, no matter how meritorious otherwise, to the economic detriment of other classes.

Summary

With specific reference to certain recent publications, supplementary experiments were carried out to provide added support for the rationale of the authors' "semi-micro" method of testing quaternary ammonium compounds. Confirming evidence was obtained, in the case of cationics, for the transfer, out of the "medication" and into the subculture, of greater numbers of bacterial cells by means of glass slides than by pipette of the same volume of liquid (as adhering to the slides). No such phenomenon was observed in the case of phenol or of certain phenolic compounds. Brief reference is made to Bacto-Oxgall as an efficient means of suppressing bacteriostasis by cationic compounds.

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(6) G. Eckfeldt and L. H. James; *Soap and Sanitary Chemicals*, Vol. 23. Nov. and Dec. 1947.

TABLE III

Disinfectant	*Dilution*	*Eb. typhosa*		*Staph. aureus*	
		0.05 cc.	*Slide*	0.05 cc.	*Slide*
Quaternary Ammonium Compound C — 10%	1:2000	0	15		
	1:3000	17	189		
	1:4000			2	1449
	1:6000			40	1890
Quaternary Ammonium Compound D — 10%	1:4000	14	567	441	6300
	1:6000	55	9450	252	2420
Cresol Compound U.S.P.	1:160			177	95
	1:200			819	500
	1:250	0	0		
	1:275	1	1		
	1:300	‡	‡		
Cresylic Disinfectant declared p. c. 5	1:250			9	8
	1:300			80	44
	1:400			882	400
	1:600	1260	819		
	1:700	‡	‡		
Synthetic Phenolic Disinfectant II	1:400			126	131
	1:500			567	504
	1:700	12	11		
	1:800	882	567		
	1:900	‡	‡		

‡ Indicates innumerable colonies covering the plate.

TRADE NEWS . . .

Form Pittsburgh Agricultural Chemical Co.

The formation of a new affiliate to handle the sale of a complete line of insecticides, rodenticides, disinfectants and related products with William J. Haude as president and Dr. Joseph B. Skaptason as vice-president in charge of sales and development, was announced late in February by Pittsburgh Coke & Chemical Co., Pittsburgh. The new organization, which will make its headquarters in the Empire State Building, New York, will be known as Pittsburgh Agricultural Chemical Co. Sales offices will be maintained in a number of principal cities in the U. S. and Canada. An expansion program of over $2,000,000 is being undertaken by Pittsburgh Coke & Chemical Co. to continue its chemical development.

WILLIAM J. HAUDE

DR. J. B. SKAPTASON

Both Mr. Haude and Dr. Skaptason, who resigned last month as vice-president and sales manager and technical sales director, respectively, from John Powell & Co., New York, have been named directors of the newly formed company.

Flanagan Joins Federal

John J. Flanagan, son of Mal Flanagan of Federal Varnish Co., Chicago, has joined his father with Federal, it was learned recently. His father is regional vice-president of the Central Division of the National Sanitary Supply Association.

DuCharme Joins Reynolds

G. W. DuCharme has resigned from Continental Can Co., New York, as products sales manager of non-food containers, including low pressure, aerosol dispensers for insecticides, to join Reynolds Metals Co., Richmond, Va., it was learned last month. Mr. DuCharme will be industry manager for the can division of Reynolds. He had been with continental Can Co. for 20 years in various sales capacities, including district sales manager in New York.

du Pont Building BHC Plant

Construction of a new unit to manufacture benzene hexachloride, was begun late in February by E. I. du Pont de Nemours & Co., for its Grasselli Chemical department, in Houston, Tex.

Purdue Conference Apr. 5-9

The 12th annual P. C. O. Conference at Purdue University, Lafayette, Ind., will be held Monday through Friday, the week of Apr. 5-9, it was announced recently by Dr. J. J. Davis of the Department of Entomology at Purdue. Registration fee, which covers cost of the conference manual, banquet and other expenses is $10. One room, possibly two will be set aside for exhibits of insects, insect damage, equipment, gadgets, etc. These should arrive not later than Apr. 4.

Portley Joins Fairfield

Joseph J. Portley, for the past three and one-half years tchnical director of the industrial division of Winthrop Chemical Co., New York, has been appointed to a similar position with Fairfield Laboratories, Inc., Plainfield, N. J., and its wholly owned subsidiary, Rhodes Chemical Corp., Philadelphia, it was announced recently. Mr. Portley has conducted extensive research in the evaluation of quaternaries for industrial and institutional applications, and was at one time associated with the Plainfield, N. J., health department.

Maintenance Exhibit Aug. 2

The second annual Building and Maintenance Supplies Exposition will be held at Grand Central Palace, New York, Aug. 2-6, inclusive, 1948, it was announced recently. The show is designed to attract maintenance men, superintendents, managing agents and purchasing agents.

Coast Chem. Co.

Moss Office Supplies, Pascagoula, Miss., has sold Coast Chemical Co., 118 E. Bay View Ave., Biloxi, Miss., to C. A. and L. R. Radd, it was learned recently. Under the new ownership, the firm will serve the Gulf Coast from Bay Saint Louis, Miss., to Mobile, Ala., offering a complete line of janitors' supplies, including soaps, floor sweeping compounds, deodorant blocks, mops, etc.

AIFA Meets in Washington

The role of insecticides, fungicides and herbicides in protecting food and grain was the principal topic of discussion at the two-day meeting of the Agricultural Insecticide & Fungicide Association, held at the Hotel Statler, Washington, D. C., Feb. 19-20.

Johnson Builds in L. I. C.

A new, 35,000 square foot office and warehouse is being built for S. C. Johnson & Sons, Racine, Wis., floor wax and polish manufacturers, at 33-16 Woodside Ave., Long Island City, N. Y., it was learned late in February. The building, which is to be of brick veneer and glass, will cost $500,000 and will be located on a 45,000 square foot plot. It is expected it will be completed by Sept. 1, 1948. The property is served by a railroad siding from the Long Island Railroad.

The new Johnson warehouse, which will serve to accommodate the company's customers in the New York area, was designed for modern material-handling equipment and will contain inside truck docks to service four trucks at one time. Two of the docks will handle a trailer and tractor. Pallets and forked trucks will be used to move the company's wax products within the building. A two-story, fluorescent lighted and air-conditioned office containing 5,000 square feet of floor space will be adjacent to a two story glass enclosed lobby.

Casco Making Aerosols

Casco Products Corp., Bridgeport, Conn., manufacturers of household and automobile products, have entered the field of low-price, aerosol insecticides, it was learned recently. The company will market two aerosol bombs of the disposable can variety: "Casco" and "Perfection." The containers will be of 12-ounce capacity and equipped with push buutton control.

Houston PCO Dies at 61

T. E. Franklin, owner of Franklin Pest Control Co., Houston, Tex., and treasurer of the Houston Pest Control Assn. died of a heart attack recently at the age of 61.

Leaves U.S.D.A. for Law

Anton B. Mutz, formerly of the Insecticide Division of the U. S. Department of Agriculture, resigned from that position Feb. 6, to enter private law practice in Chicago, where he will specialize in matters pertaining to the Federal Insecticide, Fungicide and Rodenticide Act and the Federal Food, Drug and Cosmetic Act. Mr. Mutz, who is a graduate of DePaul

ANTON B. MUTZ

University Law School, Chicago, joined the Insecticide Division in 1941. He is a veteran of World War II, having served with the 380th Bomb Group of the Fifth Air Force in the Southwest Pacific. Mr. Mutz will make his office at 111 W. Monroe St., Chicago 3.

Discuss Bakery Sanitation

A special, five-day course in bakery sanitation was held by the American Institute of Baking in Chicago from Feb. 9 to 13, inclusive. Topics discussed at the meeting included determination of sanitary conditions of a bakery, rodent proofing, rodent control through building and trapping methods, "essential facts" of insect life, insect control methods, use of contact and residual sprays for insect control, preventative fumigation, facts on detergents and cleaning agents for use in the bakery and problems of cleaning bakery machinery.

New Sanitation Monthly

Cuba has a new monthly periodical, *Boletin Informacion Sanitaria*, dealing with problems of general sanitation, according to a letter received late last month from Charles R. Lichtenberg of Chicago Sanitary Products Co., who visited Havana, while on a Caribbean cruise.

Varley Has Tablet Sanitizer

A quaternary germicide compound in tablet form designed to dissolve rapidly and form clear solutions was announced during February by James Varley & Sons, Inc., St. Louis. The tablets to be marketed under the name "Q-Tabs," are to be sold in bulk and in small containers holding 100 and 200 tablets. Tablets are available for resale under private brand or can be sold under the manufacturer's name. One tablet will make two and one-half gallons of sanitizing solution for rinsing glassware, eating utensils, etc., according to the manufacturer. Tablets are said to break up in about 30 seconds after being placed in water and to dissolve completely in about two or three minutes. Solutions are clear, with no sediment or cloudiness.

Bocon Appoints Boeck

The appointment of Frank C. Boeck as vice-president of Bocon Chemical Corp., New York manufacturers of moth proofing compounds, was announced by the company in February. He has been with Bocon since 1947 and will have charge of the sale of company products to the industrial applicator field. Previously he was president of Bex Detergent Co., an organization formed by Mr. Boeck. Earlier he had been with Colgate-Palmolive-Peet Co., Jersey City, N. J. for 26 years, more recently as assistant manager of industrial sales.

Devlin to Continental Can

John S. Devlin, formerly with the War Assets Administration, and before that operations engineer in the Far East for Standard-Vacuum Oil Co., has been appointed product sales manager for steel containers by Continental Can Co., New York, it was announced late in February. Earlier, Mr. Devlin was sales manager for Bennett Mfg. Co., Chicago, now a division of U. S. Steel Products Co., and a sales representative for Wilson & Bennett Mfg. Co., Chicago, now Inland Steel Container Co. He will make his headquarters in New York, where he will be in charge of sales of welded steel drums and pails and light drums and non-welded flaring pails.

NSSA To Hold 25th Annual Meeting, Chicago, April 18-21

JULES R. LOVINGER
N.S.S.A. President

LEO J. KELLY
Executive Vice-President

THE National Sanitary Supply Association will celebrate its 25th anniversary at the Association annual meeting at the Morrison Hotel, Chicago, April 18 through the 21st. An attendance over 800 is anticipated by Leo J. Kelly, association executive vice-president. A number of leading American authorities on both technical and merchandising phases of the sanitary supply and janitor supply industry are listed among the speakers at the four-day convention.

In addition to open meetings, group conferences and committee meetings, over 100 suppliers of soaps, detergents, cleaning specialties, disinfectants, insecticides, waxes and polishes, and associated janitor supply quipment and accessories will have merchandise displays. Exhibit booths will be located in the Mural Room and parlors, and in the Roosevelt Room and parlors on two floors of the Morrison Hotel. All exhibit space was sold out several months ago.

In arranging for its 25th anniversary celebration, NSSA officers are planning for the largest attendance since the Association first met in St. Louis in 1923 when a small group was called together by Al Richter, president of the St. Louis Janitor Supply Co. This year's meeting will extend four days and will close with the annual banquet on the evening of April 21.

Jules R. Lovinger of the Lovinger Disinfectant Co., Salt Lake City, president of NSSA will preside at the Chicago gathering. The program will be in charge of Herman Krankel, Krano Sanitary & Janitor Supply Co.; Norman Rothfield, Ramrod Chemical Co.; A. J. Kalmis, Magic Sanitary Products; W. A. Boettcher, W. A. Boettcher & Co.; Ed Wilson, Ludwig Wilson & Co. Registration will be in charge of Carl B. Lien, NSSA treasurer, Lien Chemical Co.; E. H. Pinnus, Paeco Supply Co.; J. F. Hohenadel, Illinois Duster & Brush Co.; Lou Waldron, Columbia Chemical Co.; Hans M. Schmidt, Cotton Specialty Co. Arrangements for the banquet and entertainment are in charge of Marshall L. Magee, T. F. Washburn Co.

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N.A.I.D.M. Committees

The following committee chairmen were recently named by Gordon M. Baird, Baird & McGuire, Inc., Holbrook, Mass., president of the National Association of Insecticide and Disinfectant Manufacturers: L. J. Oppenheimer, West Disinfecting Co., Long Island City, executive committee; R. M. Stevenson, Givaudan-Delawanna, Inc., New York, associate members committee; W. J. Zick, B. Heller & Co., Chicago, legislative committee; D. W. Lynch, Velsicol Corp., Chicago, membership committee; R. O. Cowin, Standard Oil Co. of Ohio, Cleveland, public purchases committee; John A. Brereton, Worrell Manufacturing Co., St. Louis, disinfectant merchandising committee; F. O. Huckins, Sinclair Refining Co., Chicago, insecticide merchandising committee; John A. Marcuse, West Disinfecting Co., Sanitary specialties merchandising committee; H. E. Reinhardt, Boyle-Midway, Inc., New York, sprayer committee; H. E. Peterson, Continental Filling Corp., Danville, Ill., aerosol committee; George F. Reddish, Lambert Pharmacal Co., St. Louis, disinfectant scientific committee; A. C. Miller, Gulf Research & Development Corp., Pittsburgh, Pa., insecticide scientific committee. R. C. Haring, John Powell & Co., New York, chemical analysis committee — insecticide section; Melvin Fuld, Fuld Bros., Inc., Baltimore, sanitary specialties scientific committee. Convention committees: Ira P. MacNair, MacNair-Dorland Co., New York, arrangements; John H. Calo, John H. Calo Co., New York entertainment; Friar Thompson, R. J. Prentiss & Co., New York, program; T. Carter Parkinson, McCormick & Co., Baltimore, exhibit.

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New Germicidal Lamp

A new and improved, germ-killing, ultraviolet lamp, that is said to be twice as deadly to bacteria as any previous lamp, has been developed by Westinghouse Electric Corp., Pittsburgh, it was announced recently. In addition to having its ultraviolet radiations stronger and more uniform, the new lamp has a rated life of 6,000 hours, equivalent to about a year of normal usage. Known as the "Slimline Germicidal Sterilamp," the product is said to cut the over-all cost of ultraviolet protection almost in half. Radiations are generated in the lamp by passing electric current through a wand-shaped tube containing mercury vapor and gasses.

ADVERTISING
CLOSING DATE
for SOAP AND SANITARY
CHEMICALS is the

10th
of preceding month

Your cooperation in furnishing copy instructions on time will help us meet our publication date.

Plan Urban Rat Control Campaign

DESIGNED to supplement the Rural Rat Control Campaign now being conducted, the National Urban Rat Control Campaign, scheduled to run from March through April of this year, got underway with a spirited discussion of rat control application problems of industrial and institutional properties, at the Hotel Biltmore, New York, Feb. 18.

Present at the meeting, were Hamilton M. Warren, vice president of National Carbon Co., New York, and chairman of the National Committee on Rat Control, as well as experts of the Fish and Wildlife Service, U. S. Department of the Interior, Washington,D.C.

In mentioning that the campaign is a part of the President's Emergency Food Conservation Program, Mr. Warren, stressed the fact that total rat damage in the U. S. is now estimated at two billion dollars annually, half of which amount is accounted for by rat contamination and destruction of foodstuffs. Every year rats destroy more than 200 million bushels of grain, almost half the amount the U. S. plans to send to Europe during 1948, Mr. Warren said.

Dorr Green and Clifford C. Presnell, chief and asst. chief, respectively, of the Predator and Rodent Control division of the Fish and Wildlife Service, outlined plans for an intensive national campaign to arouse public feeling to the necessity for rat control. Emergency food conservation funds of $100,000 that have been made available to the Fish and Wildlife Service are sufficient only for a two-month program. However, it was felt by the officials that each city participating in the campaign would be left in a position to carry on its own program effectively and continuously at the expiration of the two-month period.

Working together, the National Committee for Rat Control and the Fish and Wildlife Service are preparing the materials to help localities fight rats. Included in the program are posters, pamphlets, and local information bureaus composed of professional and commercial rat-control specialists. Actual rat killing will be done by trapping, poisoning, and gassing, either by private citizens or through commercial exterminators.

Secretary of the Interior Krug is now sending personal letters to all mayors of cities with populations of over 10,000, inviting them to join the war on rats. He asks that they form citizens committees to make the public conscious of the problem, to see that their cities are equipped for the fight, that anti-rat laws are on the books and ready to be enforced, and that each city has a rat-control unit adequately financed and staffed for the work.

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Lists Emulsion Advantages

Pest Control Equipment Co., New York, recently released a bulletin on the advantages of using an emulsion type insecticide. Among the advantages of emulsions, according to the bulletin, are: the absence of a fire hazard; (2) easy availability; (3) absence of odor and taste; (4) fast evaporation; (5) less danger of slipping on floors on which an emulsion may have been sprayed; (6) Reduction or limination of danger to furniture, floors, etc.

Pest Control Equipment Co. is now manufacturing "Lucide A-20," one of the first commercially available Chlordane colloidal emulsions that is thermodynamically stable.

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Study CO_2 as Propellant

The U. S. Department of Agriculture recently issued a lengthy release entitled "Carbon Dioxide as a Propellant for Insecticide Solution" by R. A. Fulton of the division of Insecticide Investigations. The paper was based on studies made by the Agricultural Research Administration and the Bureau of Entomology and Plant Quarantine of the U. S. D. A. The study was undertaken to determine possibility of use of carbon dioxide for increasing the pressure of aerosol solutions, thus making the mist effective for greater distances, and to decrease the cost of the solution by reducing the Freon content.

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Bee Chem. Elects Self

M. A. Self, sales manager of the company since 1947, was elected vice-president in charge of sales and a director of Bee Chemical Co., Chicago, at a joint meeting of the stockholders and board of directors, Feb. 2. He is a graduate of the University of Kansas in chemical engineering and was formerly connected with Sharples Chemicals, Inc., Philadelphia, in sales development.

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New Insecticide Emulsifier

A new "Toxaphene" insecticide emulsifier, "Emcol H-30," has been developed by Emulsol Corp., Chicago, according to a recent announcement of the company. Stable water emulsions of "Toxaphene" can be made with the new emulsifier. A concentrate of the "Toxaphene" and emulsifier is first produced which is said to be readily miscible with waters of any hardness.

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Mich. Chem. House Organ

DDT and its role in helping to provide more food for Europe are discussed in the February issue of *Pestmaster Progress*, external house organ of Michigan Chemical Corp., St. Louis, Mich. Toxicity of DDT and its use in controlling head lice are treated in two other articles in the February issue. In mentioning the company's new, low-pressure aerosol product, it is stated that the initial production of the bomb sold out in 12 days.

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New Hyman Bulletin

Technical supplement No. 203A — "Eradication of Livestock Parasites: Ticks, Lice, Fleas, Flies and Hog Mange" is now available from Julius Hyman & Co., Denver, Colo., the company announced Feb. 19.

Above: Photograph of the group attending the eighth annual Eastern PCO Conference at the University of Massachusetts, Amherst, Feb. 2, 3 and 4. Total attendance at meeting was 165. Newer chemical compounds were reviewed and laboratory sessions on insect identification were held. Group discussion was a feature of the sessions on the control of rodents.

Market Beer Can Aerosols

THE "beer can" aerosol insecticide made its debut before the retail consuming trade in New York, Feb. 26, when Gimbel Brothers department store advertised the new, low-priced "bombs" for 98 cents. Gimbel's inaugural advertising on the new "Fingertip" aerosol bomb, made by Continental Can Co., New York, is reported to have come as something of a surprise. Most sources thought the bombs would sell originally in the $1.10 to $1.29 price range at retail, and gradually work down to the dollar and under category. The active ingredients reported to be used in the Gimbel bomb are pyrethrum and two percent DDT.

New Brochure

West Disinfecting Co., Long Island City, N. Y., recently announced the availability of a new, 12-page brochure, entitled, "An Ideal Washroom Maintenance Service." The brochure covers in detail the nationwide washroom service maintained by West.

New Peterman Division

Dr. Heber C. Donohoe, director of research for the company since 1943, last month was appointed director of the newly organized technical division of William Peterman, Inc., Newark, N. J., insecticide manufacturing firm.

ROACH CONTROL TESTS

(*From Page* 149)

from a crude material with a 10 per cent gamma content, C from a different crude with a 10 per cent content and B from a technical material with a 30 per cent content. Each material was diluted for these tests to mix-

TABLE 3. The percentage of kill and the average survival time of German roaches treated in a dust settling chamber with various insecticide mixtures. Diluent in all mixtures pyrophyllite. October, 1946 to May, 1947.

Insecticide	*Percent active ingredients*	*MALES* Percent kill	*MALES* Survival time	*FEMALES* Percent kill	*FEMALES* Survival time
Benzene hexachloride (1)	2.0	100	19.5	100	31.0
	1.0	100	23.7	100	38.8
	0.5	100	22.1	100	32.8
	0.3	100	35.3	100	56.2
	0.2	100	31.3	94	41.7
	0.1	50	58.0	20	74.0
Benzene hexachloride (2)	1.0	100	27.9	98	39.7
	0.2	72	35.6	42	65.9
Gamma isomer of BHC (3)	2.0	100	23.5	100	41.7
	1.0	100	21.5	100	43.1
	0.5	100	22.1	86	55.1
	0.3	67	54.4	35	62.2
	0.2	30	53.6	0	—
	0.1	11	72.0	5	—
Benzene hexachloride (4) A	0.3	100	35.0	98	57.7
B	0.3	92	34.4	65	64.5
C	0.3	100	36.0	100	56.5
A	0.2	98	35.5	84	58.7
B	0.2	72	45.7	26	65.3
C	0.2	100	34.6	98	61.1
DDT (DuPont 50% W powder)	5.0	100	37.2	100	64.7
	2.5	100	41.4	88	70.7
	1.75	77	63.0	34	89.0
	1.0	85	51.1	46	63.0
	0.75	34	59.4	28	76.4
	0.5	7	—	0	—
Sodium fluoride (commercial grade)	50.0	100	34.3	90	60.7
	25.0	92	52.9	74	68.1
	10.0	86	63.5	32	73.7
	5.0	52	78.3	14	90.0
	2.5	22	67.1	6	—
Chlorinated camphene (5)	2.5	100	41.4	100	60.3
	1.0	100	61.0	80	80.7
	0.75	97	68.2	42	86.0
	0.5	82	77.8	33	80.0
	0.25	12	—	0	—
Thiophos 3422 (from 0.25% dust)	0.25	100	21.1	100	39.0
	0.1	100	25.2	98	37.9
	0.05	92	32.6	70	44.3
	0.03	42	45.1	20	51.6
Chlordane (from 1945 2% dust)	1.0	100	58.5	91	83.1
Chlordane (from 1946 5% dust)	5.0	100	43.9	100	60.3
	2.0	100	57.4	89	73.9
	1.0	98	51.7	83	83.1
	0.75	61	71.8	23	89.0
	0.5	56	78.2	22	90.4
	0.25	14	84.6	0	—

tures containing 0.3 and 0.2 per cent gamma and at the latter dilution A killed 84 per cent of the females, B 26 per cent and C 98 per cent.

The results in this and the previous year showed considerable variation in effectiveness in the samples of benzene hexachloride from different sources. All samples, except the pure gamma, had the strong odor characteristic of this chemical and for that reason would not make a satisfactory roach powder for use in homes and food processing plants. A commercial product reported to be the pure gamma dissolved in a highly volatile solvent was made into a dust by mixing 10 cc. of the liquid in 10 grams of a dust carrier. After the solvent evaporated from the mix, it was used in the dust chamber and killed all males in less than 15 hours and all females in about 19 hours.

Perhaps the outstanding new chemical tested was parathion (O,O-diethyl O-p-nitrophenyl thiophosphate), released experimentally as "Thiosphos 3422." The base dust contained 0.25 per cent of the active ingredients and at that strength killed all roaches. At an 0.1 per cent dilution 98 per cent of the females were killed. Although this chemical shows promise against many insects, its reported toxicity to higher animals would possibly prevent its adoption for use in the home or around food. Two related compounds, hexaethyl tetraphosphate and tetraethyl pyrophosphate, also gave good kills of roaches.

"Toxaphene," a chlorinated camphene compound, was tested in two seasons and gave good results. Chlordane, a chlorinated hydrocarbon, had about the same toxicity to roaches, while another chlorinated hydrocarbon compound, DDT, gave about the same kill. Both a chlordane and a DDT dust have been recommended for roach control, while additional studies on the toxicity of *"Toxaphene"* are needed before it can be suggested for general use.

All of the new chemicals in Table 3 were far better than a commercial grade of sodium fluoride, which gave only a 90 per cent kill of females at a 50 per cent dilution. Since our laboratory method of testing forces the roach to run through the chemical for eight minutes, this brand of sodium fluoride would be of little value under normal conditions of use. The differences in kill between several of these chemicals were rather small, but based on our tests the materials could be rated in the following order: parathion, benzene hexachloride (sample 1), purified gamma isomer of BHC, *"Toxaphene,"* chlordane, DDT and sodium fluoride.

During the past three years, three commercial mixtures containing piperonyl cyclohexenone and pyrethrum extract have been tested. These mixtures killed roaches by contact action and had little residual value. The freshly-opened mixtures gave a good kill of German roaches and could be diluted to half and a quarter strength without too much loss of strength.

Several chemicals tested in the past three years have not been included in the tables, as most of them gave a poor kill when diluted with pyrophyllite to a 25 per cent strength. Of these materials the following gave either no kill or a low kill: benzalaniline, dichloroaniline, p-bromoiodobenzene, p-aminodiphenyl, 2-methylbenzimidazole, p-nitrobromobenzene, o-nitroiodobenzene, tetrabromo-o-cresol, 3-hydroxy-2-naphthoic acid, 2,4-dichlorobenzyl pyridinium and 3,4-dichlorobenzyl chloride pyridinium salt. A sample of the ground-up plant, *Ryania speciosa* ("Ryanex" 100 per cent), at a 25 per cent dilution with pyrophyllite gave no kill, while the addition of 50 per cent pyrethrum marc increased the kill to 45 per cent for males and 6 per cent for females. Three materials giving a fair kill were hexachlorophenol, b - iodonaphthalene and p-bromodiphenyl.

TABLE 4. The percentage of kill and the average survival time of German roaches treated by the dust settling chamber method with various mixtures containing piperonyl cyclohexenone. Tests in 1945, 1946 and 1947.

Mixtures	*Percent Pyrethrins*	*MALES* Percent kill	*MALES* Survival time	*FEMALES* Percent kill	*FEMALES* Survival time
Chipman's P-C-H 100 containing 2.5% piperonyl cyclohexenone, and 0.2% pyrethrins in marc....	0.2	100	15.9	94	46.0
Above 25%-pyrophyllite 75%.....	0.05	100	15.0	92	41.3
Above 25%-marc 50% pyrophyllite 25%	0.05	100	23.0	23	40.7
Planters' mixture containing 1.25% piperonyl cyclohexenone and 0.16% pyrethrins in marc.....	0.16	100	16.5	98	27.3
Above exposed to air 13 days.....	—	100	20.9	62	34.0
Above exposed to air 29 days.....	—	100	12.8	90	46.4
Above exposed to air 54 days.....	—	97	18.1	33	40.6
Arfax mixture containing 1.25% piperonyl cyclohexenone, pyrethrins 0.10% and 25.0% boric acid in marc. Mixture diluted with pyrophyllite to give percentage pyrethrins in finished dust.	0.05	100	16.3	100	36.7
	0.03	98	33.6	62	47.7
	0.025	100	26.2	45	56.7
	0.02	78	41.2	8	—
	0.01	20	81.8	6	—

Summary

DURING the past three years a number of chemicals have been tested in the laboratory against the German roach to determine their effectiveness as insecticides. Among the materials that gave a good kill of roaches were parathion, benzene hexachloride, chlordane, *"Toxaphene,"* azobenzene, calcium dicyanimide and DDT. While these materials gave a good kill in laboratory tests, this does not necessarily indicate that they would be good insecticides against roaches, as many of them have objectionable features, such as unpleasant odors and toxicity to higher animals. Those materials, however, with high toxicity to roaches show promise as insecticides and may be of value against other insects.

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